MAR 25 1954

Roy Moore

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

DESIGN INFORMATION BULLETIN
(Report No. ZM-5-001)

NO.: 1.006
Addendum A

XFY-1 PROJECT

DATE: 19 March 1954

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Pay Periods

Procedure: The following procedure has been established regarding the issuance of paychecks to Convair personnel to be permanently attached at Moffett Field during the XFY-1 tethered flight program:

A. Hourly Personnel

1. On the first Friday at Moffett Field checks will be distributed for the previous week's time spent at San Diego.

2. Beginning with the second week at Moffett, paychecks will be distributed one week late due to the extra time required to process and transport time cards and checks. However, on the second Friday at Moffett Field, a cash advance will be issued each hourly employee in the amount of his gross pay less withholding taxes only. This check is to be issued in lieu of the normal paycheck that would be distributed on that Friday.

3. On the third Friday at Moffett a regular check will be issued with the normal deductions, plus deductions for items not taken on the cash advance check. Therefore, starting with this week, paychecks are one week in arrears, but the cash advance check has prevented a gap in the weekly pay procedure. Regular paychecks will be issued each Friday thereafter.

NOTE & RETURN TO
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Harvey Williams 3/26
File 50-156-3

4. On the last week at Moffett, two paychecks will be issued to each employee - the normal paycheck and a second check with any adjustments necessary minus the cash advance given on the second Friday at Moffett Field.

B. Flat Salary Personnel

Paychecks will be distributed upon their receipt following normal processing of time cards which will remain in San Diego. It is not expected that there will be enough delay in receipt of these paychecks to cause the forwarding of cash advances.

Mailing

Personnel wishing to have their paychecks mailed to their home in San Diego instead of Moffett Field should so notify the Model 5 Project Office.

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

DESIGN INFORMATION BULLETIN
(Report No. ZM-5-001)

NO.: 1.008 - Addendum A
(Page 2)

XFY-1 PROJECT

DATE: 19 March 1954

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Transportation

Convair personnel traveling by Navy shuttle plane to Moffett Field are reminded to check their personal insurance policies for coverage on military flights. The aircraft liability insurance provided by Convair is good for this flight as is the Convair group insurance and the Workmen's Compensation Benefits. Additional flight insurance for the above Navy flights is available, if desired, at the Production Flight Office, Building 4, telephone - extension 1188. The rate to Moffett Field is $5.00 for $25,000 coverage. This cost is not a reimbursable expense.

Expense Reports and Checks

Per diem checks will be paid on the basis of directions requested in expense reports which are to be submitted weekly by each employee permanently assigned to Moffett Field. It is advisable to request several weeks per diem as a travel advance in the request for travel order, sinse it will take that length of time to process the first expense reports. Expense reports will be audited at Moffett Field before submittal to San Diego in order to correct items which may cause delay in obtaining approval.

Prepared by R. S. Stewart
R. S. Stewart

Approved by L O Cederwall
L. O. Cederwall
Chief Admin. Engineer

Approved by C B Carroll
C. B. Carroll
Project Engineer

Ray Moore

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

FEB 26 1954

DESIGN INFORMATION BULLETIN
(Report No. ZM-5-001)

NO.: 1.008

DATE: 18 Feb. 1954

XFY-1 PROJECT

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Before Leaving San Diego

Travel Order A travel order approved by the XFY-1 Project Office will authorize your trip to N.A.S., Moffett Field. Keep the blue copy until your return to San Diego. If driving a personal car, carry your personal liability and property damage insurance policy with you.

Security Clearance A master list has been submitted to Moffett to provide security clearance for those who will have business there. In the event it becomes necessary to send personnel not on the list, clearance must be obtained through Security Office at time travel order is issued.

Expense Reports Employees are instructed to read D.S.P. 1-13 and instructions on the back of the expense report before leaving San Diego.

Travel The means of transportation to Moffett Field should be arranged to suit your needs. Personal or Convair cars may be used when authorized by your Travel Order. Emergency trips by Navy shuttle aircraft from North Island or by company plane, if available, may be arranged by the XFY-1 Project Office, Room 302A, Bldg. 51, or call Ext. 1748. Requests for transportation via Navy shuttle plane must be requested by the Project Office 48 hours in advance. Flights depart from the VR5 Terminal (Bldg. 700), N.A.S., just south of the main tower at North Island.

Flight time is as follows:

Leave San Diego	9:00 A.M.
Arrive Moffett Fld.	11:30 A.M.
Leave Moffett Fld.	2:00 P.M.
Arrive San Diego	4:30 P.M.

Passengers must check in at least one hour before departure from North Island and at least two hours before departure from Moffett. Note: Only passengers with properly executed orders are permitted to travel via Navy shuttle.

Rides or Riders When a ride or riders are wanted, contact XFY-1 Project Office at the above location in San Diego. Moffett Field is 494 miles from San Diego. An allowance of $.07 per mile will be made for travel by personal automobile when approved by travel order (total $34.58). Riders will not receive a mileage allowance.

NOTE &

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FILE #50-156-3

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

DESIGN INFORMATION BULLETIN
(Report No. ZM-5-001)

NO.: 1.008 (Page 2)

Date: 18 Feb. 1954

XFY-1 PROJECT

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Plan Your Transportation

Transportation to Moffett from termination points for commercial carriers is not too convenient unless previous arrangements are made before leaving San Diego. San Francisco is about 40 miles north of Moffett Field and it is not necessary to go there unless traveling by commercial air line. In this case you will land at San Francisco air terminal about 15 miles south of San Francisco and 25 miles north of Moffett Field on Highway 101 near San Bruno. From there you may take a taxi to San Bruno or a limousine to San Francisco; then take the commuter train to Mountain View. You may then get transportation to Moffett by taxi. Limited Greyhound Bus service is also available between the airport and Mountain View.

Highway Travel from San Diego to Palo Alto, Mountain View and Moffett Field Area

Moffett Location

Moffett Field, the Naval Air Station and test center, is located on Highway 101 coast route at Moffett Field, California approximately 12 miles north of San Jose and five miles south of Palo Alto. The nearest rail station and Post Office is Mountain View, approximately two miles from the main gate at Moffett. It is 494 miles north of San Diego and about 40 miles south of San Francisco.

San Diego to Moffett

Leave San Diego on Route 101, drive through Los Angeles, Santa Barbara, Paso Robles, Salinas, Gilroy and San Jose. From San Jose, take Highway 101 bypass (Bay Shore Drive) to Moffett Field, approximately 12 miles beyond San Jose toward San Francisco. An alternate route which is faster and more direct than 101 above, is as follows:

San Diego to Santa Ana on Highway 101.
Santa Ana Freeway to downtown Los Angeles (Highway 101).
Hollywood Freeway to Hollywood (Highway 101).
Cahuenga Freeway to San Fernando Blvd. (Highway 101).
San Fernando Blvd. to Sepulveda Blvd. and then north to Highway 99. Sepulveda is Calif. State Highway 7.
North on Highway 99 over the Grapevine to State Highway 33-166 which turns left (west) from 99.
Follow State Highway 33 north to State Highway 152 which goes west through Los Banos to Gilroy.
At Gilroy go north on Highway 101 to Mountain View and Moffett Field.

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

DESIGN INFORMATION BULLETIN
(Report No. ZM-5-001)

NO.: 1.008 (Page 3)

XFY-1 PROJECT

DATE: 18 Feb. 1954

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Housing

Bachelor housing has been provided for Convair and subcontractors workmen in Barracks #231 just south of the No. 1 hangar where the tests will be conducted. Accommodations will also be provided in the BOQ for a limited number of visitors and permanent members of supervision at Moffett. Upon arrival, you may call Convair's Office at Moffett, Yorkshire 7-6961, Ext. 640, to obtain further information on housing, etc.

Costs for housing at Moffett is as follows:

Barracks #231 rental per person is $4.00 per month and a $5.00 deposit for linens. Meals may be obtained for those registered in the barracks at a cost of $.40 for breakfast, $.60 for lunch and $.60 for dinner.

BOQ rates for Convair people on per diem is as follows: $.50 for one day, $.75 for two days, $1.00 for one week, plus $.25 per day and a $5.00 deposit for linens. The monthly rate for board and room is $67.50 ($69.75 for 31 days). The daily rate for meals is $.55 for breakfast, $.75 for lunch and $1.10 for dinner ($1.35 occasionally). You are required to join the BOQ mess if you reside at the BOQ for longer than two weeks. It is required that a coat and tie be worn in the Officer's Mess for the evening meal.

Subsistence Allowance

A per diem subsistance allowance of $7.00 will be allowed all employees at Moffett during availability of Government quarters on the base. In those instances where such quarters are not adequate, the employee will be paid per diem in accordance with paragraph 4 of DSP 1-13.

Admission to Moffett Field - Security Clearance

Employee Clearance

When you arrive at Moffett Field, turn off the highway at Moffett Boulevard and proceed to the main gate. Park in the parking area outside and enter the main gate house to obtain car pass and be identified. If you have been cleared previously, have proper travel order, and your name is on the master list at the gate house, you will be permitted to enter on your Convair badge. No other identification will be required. Note: Under no circumstances shall Convair personnel attempt to enter Moffett Field on their Convair badge unless they are on the approved list or unless their trip has been properly authorized by travel order.

As personnel are cleared at the gate, permission shall be requested to call the Convair office on base extension #640 to report your arrival. You will then be instructed as to how to proceed from there.

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

DESIGN INFORMATION BULLETIN
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DATE: 18 Feb. 1954

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS, MOFFETT FIELD

Personal Cars on Base	To obtain a permit to operate your private automobile on the base, you must show your personal public liability insurance policy ($10,000 and $20,000 minimum and property damage of $5,000 minimum per accident). If you are to remain on the base for an extended period, a permanent pass (buff card) should be requested. If for a period of less than two weeks a temporary pass will suffice. You are cautioned to observe the traffic laws on the base or your car permit will be revoked.
Parking Areas	Parking space is available for residents of the barracks building directly across the street adjacent to the enlisted men's club house. Park where indicated by signs at other points on the base.
Conduct on the Base	Remember the fact that you are a representative of Convair on a customer-operated base. Your conduct will reflect either good or bad against the company. Good conduct is expected at all times, bad conduct is not acceptable. Your supervisors will be responsible for your conduct as well as your regular work at all times. Do not roam around the base in places where you do not have business.
Housing and Meals Outside Base	There are many housing areas, auto courts and eating places outside the base within a five to fifteen mile radius. This includes the towns of Mountain View, Sunnyvale, Palo Alto, Menlo Park, Redwood City, Santa Clara and San Jose.

Pay Periods

Time	Hourly personnel will be paid on Friday as at San Diego, either by normal paycheck or by cash advances issued against individual payroll accounts. Time cards for supervisory and flat salary personnel will remain in San Diego and be submitted by the Model 5 Project Office to Timekeeping at the end of each week. Checks for these personnel will be air mailed from San Diego to Moffett Field every other Wednesday night. Distribution of paychecks and expense checks will be made by your supervisor. Any errors or problems should be discussed with your supervisor who may find it necessary to contact the San Diego accounting office through the timekeeper at Moffett.
Cashing Checks	The Bank of America has a branch located on the base (see map for location).

Living in the Bay Area

Community Services	Shopping, professional services, banking, real estate and insurance, schools, recreation facilities, churches, libraries, etc., are all plentiful in the surrounding towns and communities listed under housing above.

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

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DATE: 18 Feb. 1954

SUBJECT: TIPS ON TRAVELING AND LIVING WHILE ASSIGNED TO NAS. MOFFETT FIELD

Public Transportation

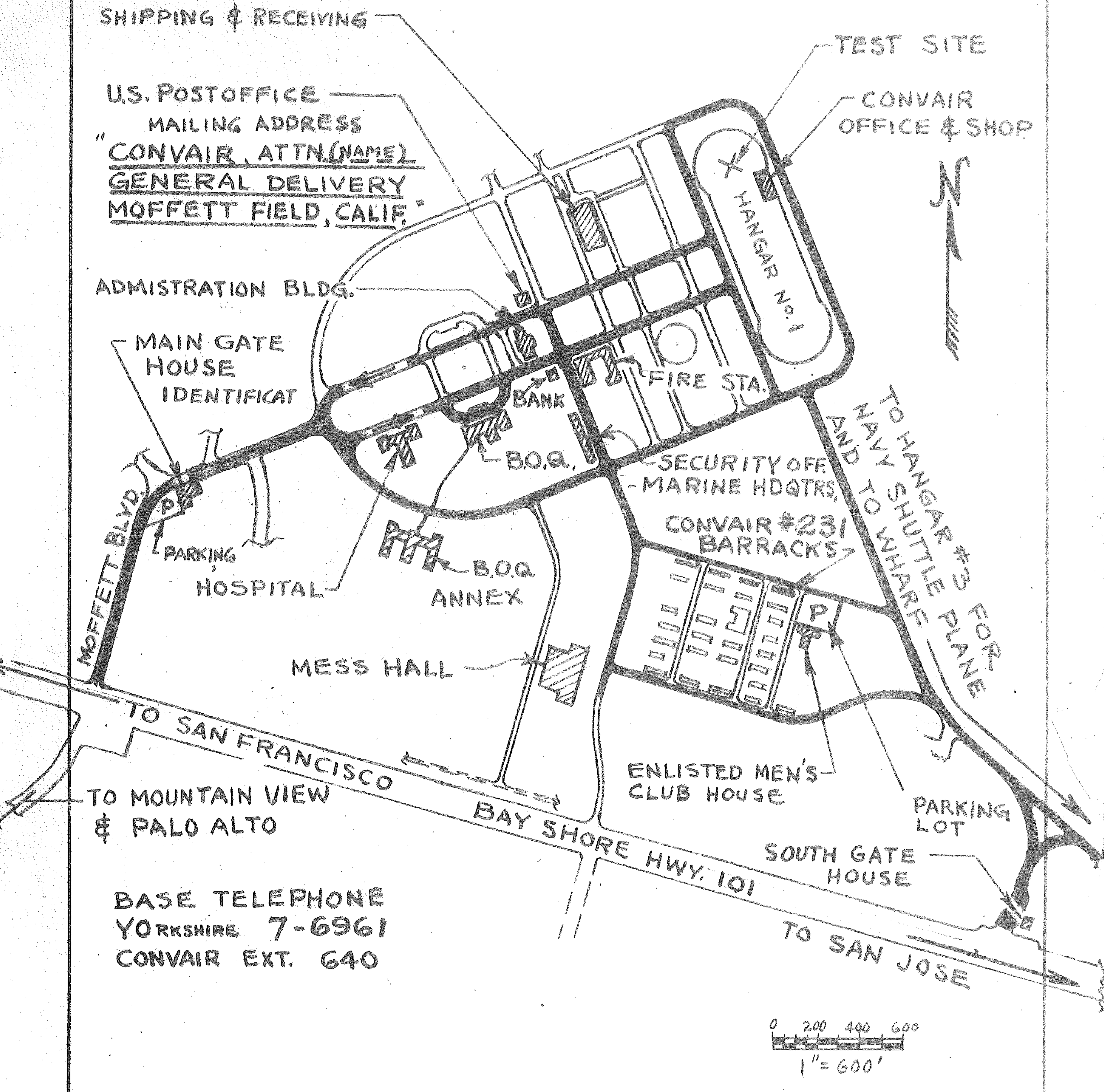
The Southern Pacific Railroad main line between San Francisco and Los Angeles runs through all the above towns. Commuter trains operate at short intervals throughout the day and night. Greyhound and other bus lines also run regular schedules between these points.

Prepared by D.B. Suggs
D. B. Suggs

Approved by LO Cederwall
L. O. Cederwall
Chief Admin. Engineer

Approved by CB Carroll
C. B. Carroll
Project Engineer

ALTERATION	DATE	NAME



MAILING ADDRESS
"CONVAIR, ATTN.(NAME)
GENERAL DELIVERY
MOFFETT FIELD, CALIF."

BASE TELEPHONE
YORKSHIRE 7-6961
CONVAIR EXT. 640

DRAWN	D.B.SUGGS	1-29-54
CHECKED		
APPROVED		

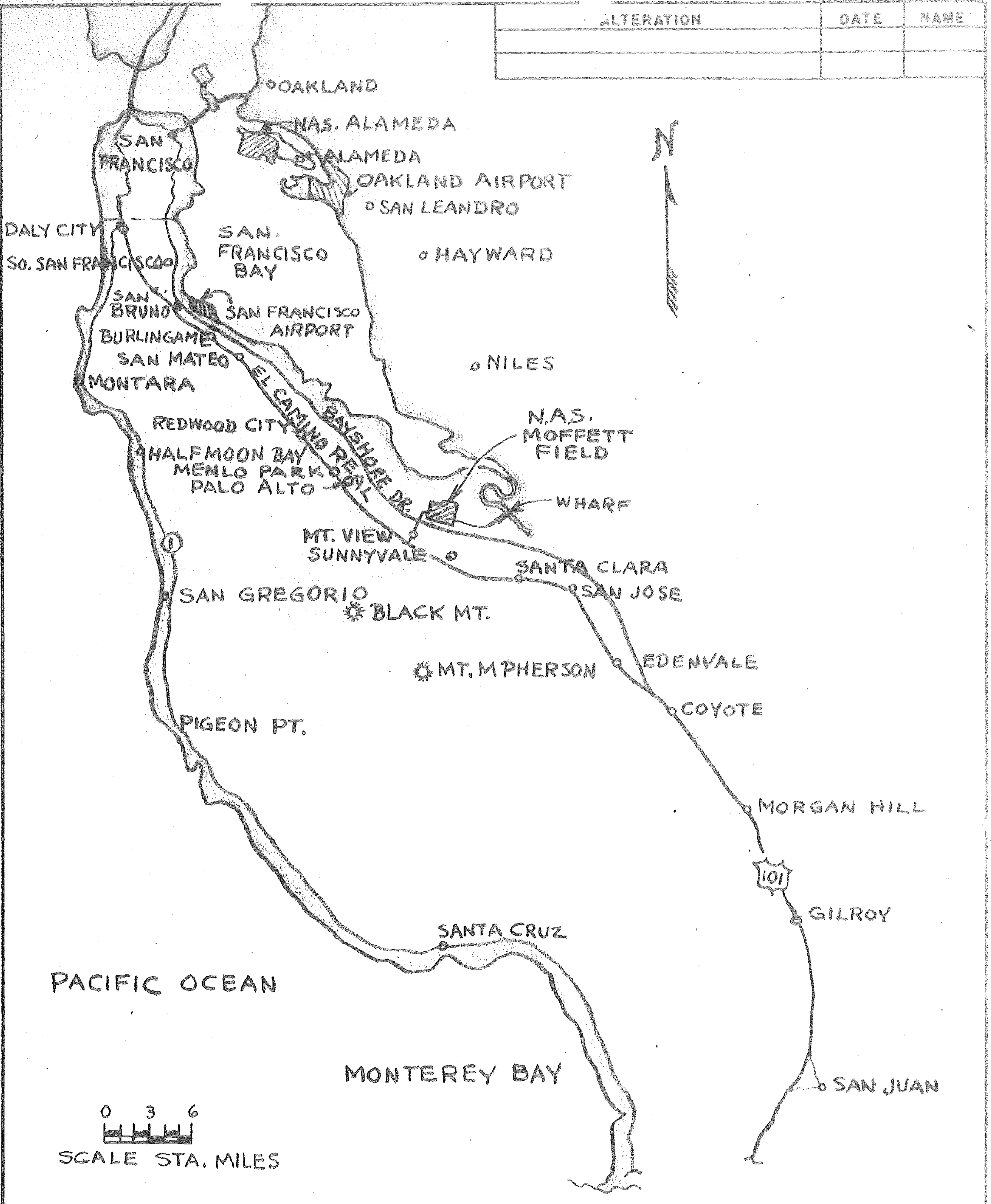
CONVAIR TEST SITE, N.A.S.
MOFFET FIELD, CALIFORNIA

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
SAN DIEGO DIVISION . . SAN DIEGO, CALIFORNIA

PART NUMBER
DIB NO.: 1.008
FIG. 1

FORM 494 REV.

ALTERATION	DATE	NAME



DRAWN	D.B. SUGGS	1-29-54	SAN FRANCISCO BAY AREA	PART NUMBER DIB NO.: 1.008 FIG. 2
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APPROVED			CONSOLIDATED VULTEE AIRCRAFT CORPORATION SAN DIEGO DIVISION . . SAN DIEGO, CALIFORNIA	

FORM 494 REV.

CONVAIR, SD

CONFIDENTIAL
SECURITY INFORMATION

Serial No. 50-356-3

Date: 11 March 1953
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Page 1

COST PROPOSAL OUTLINE

Revised: 27 April 1953

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

PILOT'S FAMILIARIZATION PROGRAM

1. PROPOSAL REQUESTED BY: Convair

Model 5 Project Office (C. B. Carroll) - Confidential Memo to L. Moore dated 23 December 1952. Minutes of Model 5 Minimum Flight Test Program Meeting dated 6 March 1953.

2. FOR SUBMITTAL TO:

BuAer

3. DATE PROPOSAL IS TO BE SUBMITTED:

To be determined by Contract Department.

4. TYPE OF BID DESIRED:

Firm

5. TYPE OF CONTRACT CONTEMPLATED:

Amendment to NOa(s) 51-936-C (CPFF)

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight.

The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES: (Cont'd)

The tethered flight gear should be so designed as to automatically prevent the airplane exceeding 3 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted.

The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

No test data not required for the above is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

No telemetering will be required for the test program at Moffett Field and no instrumentation wires would be required from the airplane. Adequate vibration warning devices would be installed in the cockpit and visual observation would be made during flight.

Radio communication will be provided between the pilot and the ground operator of the tethering equipment.

Wind conditions will not be explored in hangar.

The minimum Moffett Field program will be without autopilot.

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES (Cont'd)

The program and alternates to program for which cost estimates are to be submitted to the Customer are as follows:

A. Pilot's Familiarization Program Consisting of:

(1) Delivery and shipment of the airplane in accordance with Item 12.

(2) Design of test installations in accordance with Item I Engineering Design Task of the Detail Work Statement and Subcontract fabrication and erection of the installations including the Security provisions as described in Major Purchased Items Required, item 3a, and 4a and modification of the airplane in accordance with Item II.A. of the Detail Work Statement.

Note: Alternate figures are to be submitted for accomplishing this phase of the program with Security provisions deleted as described in Item 3b and 4b.

(3) Accomplishment of ~~Test~~ Fa. Program as outlined in the Detail Work Statement including Liaison and Maintenance ~~and preparation of reports~~.

Note: Transportation for Convair Personnel at Moffett Field to be provided. It is assumed such transportation will be rented.

Note: Personnal assigned to Moffett Field test will be on a per diem basis. Living quarters will be arranged for at or near Moffett Field. (San Jose and/or Palo Alto.)

7. DETAIL WORK STATEMENT

I **Engineering Design task is as follows:**

A. Proposal and General Study

B. Hoist and Tethering Controls Installation
- (a) Hoisting Mechanism
- (b) Counter Balance Mechanism
- (c) Automatic Control Equipment
- (d) Reels and Brake
- (e) Cable Assemblies
- (f) Pneumatic Snubber for Nose Cable
- (g) Pulleys, Idlers and Mounting
- (h) Tethering Line Installation

C. Hoisting Beam Installation
- (a) Beam Structure
- (b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation
- (a) Curtains at Arch 3, Doors and Corridor
  - (1) Curtain Catenary and Support Cables
  - (2) Curtain Reinforcement and Support Fittings
  - (3) Curtain Support Beam and Mast Rework
- (b) Cyclone Fence Installation
  - (1) At Arch 3
  - (2) At corridor
  - (3) At doors

7. DETAIL WORK STATEMENT (Cont'd)

E. Airplane ~~Modifications~~ re-installation of,

(a) Cable Attachment at Nose

(b) Tethering Line Attachment

(c) Installation of Tethering and Brake Controls

(d) Plane to Ground Communications

~~F. Procurement, Release and Check~~

G. Installation Liaison

(a) Mechanical

(b) Electrical

7. **DETAILED WORK STATEMENT** (Cont'd)

II. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to hoist and controls to accomplish Tethered or Captive condition.

B. Supply mechanics and electricians to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply spare parts, fittings, tools and equipment to maintain a "Shop" at Moffett Field. Shop facilities will be made available by the Navy at Moffett Field.

D. Maintain, service and repair Tethering equipment during test program.

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department will be required to handle this task.

F. Proof Loading Test of Hanger and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hanger structure and Hoist during the tethered flight test.

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practices. Two (2) full time inspectors will be required at Moffett Field for this purpose.

~~G. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus securing an erector.~~

7. **DETAIL WORK STATEMENT** (Cont'd)

III. **Experimental Flight Work Statement**

A. The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

B. The tethered flight gear should be so ~~designed~~ rigged as to 20 automatically prevent the airplane exceeding ~~8~~ feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted. Braking action may be applied by rig operator to prevent airplane from exceeding 8 ft. per second or any desired rate of sink.

C. The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

D. ~~No~~ test data other than that required ~~not required~~ for the above, is not to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

Date: 11 March 1953
Revised: 10 April 1953
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Revised: 27 April 1953

7. DETAIL WORK STATEMENT

IV. Aerodynamics Group

1. ~~A description of the aerodynamics task associated with the revised Moffett-Hangar captive flight program (reference (e)) is given below.~~

   ~~A. Investigate areas associated with design of tethering system in order to insure that mechanical restraints do not seriously affect flight hovering characteristics.~~

   ~~B. Make preliminary investigation of critical hovering handling characteristics from visual observations, film records and pilot observations; make studies necessary to improve possible undesirable handling qualities.~~

   ~~C. Work with pilots to develop suitable take-off and landing techniques.~~

   ~~D. Perform work necessary to develop suitable slipstream flow patterns in the cockpit areas.~~

OK

Aerodynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

V. Dynamics Group

OK

Dynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

7. DETAIL WORK STATEMENT

VI. Instrumentation Group

The Instrumentation Group will be responsible for maintenance of instrumentation at Moffett Field as installed at San Diego, for minimum flight demonstration and pilot safety purposes.

Maintenance will include airborne equipment and also operation of ground data recording cameras.

7. **DETAIL WORK STATEMENT** (Cont'd)

Revised: 27 April 1953

VII. **Engineering Test Laboratory**

~~A. Engineer methods and means for obtaining all dynamic flight data required.~~

~~B. Engineer methods and means for obtaining temperature data as directed by the Experimental Flight Group.~~

~~C. Design calibration means and procedures, also auxiliary equipment as required.~~

~~D. Calibrate all dynamic pickups and associated recording equipment.~~

~~E. Take dynamic data and temperature data throughout the program. Edit data and provide preliminary analysis preparatory to presentation to Experimental Flight Department for detailed analysis and reports.~~

~~F. The foregoing dynamic test procedures will be applied specifically to the following scheduled operations only:~~

~~Flight operational techniques.~~

~~Pilot familiarization operations.~~

A. ~~G.~~ Static Test of facility at Moffett Field. This task will be to supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast. Proof load to be applied as follows:

(a) The empty tank will be raised a short distance above floor by means of the tethered gear.

(b) Water will be added in increments of 48,000 pounds proof load and deflection of the hanger will be measured for each increment of load.

Note: The following items, which may come up in the course of this program are not to be included in this proposal but are to be quoted on separately after the requirements have been determined.

(a) Dynamic tests found to be necessary as a result of investigation of operational techniques or of pilot familiarization operations.

(b) Tests on airplane characteristics with or without Auto Pilot.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

POWER CABLE.

1. North end of Hanger to Arch #3 except Shop area along West side.

2. Four (4) Mooring Masts

3. 8 Foot "Cyclone" wire fence (approx. 170 Ft.)

4. 3 - 30 Ft. Sections and 2 - 24 Ft. Sections of movable fence to be used as gates.

5. Monorail Cars and operators (4) to assist subcontractor and Convair in setting up Tethered Flight Test equipment.

6. ~~Partitioned~~ Office Space in ~~at East Side of~~ Hanger ~~between Arch #2 and #3.~~

7. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.

8. U. S. Marine Corps Guard for Security during entire Test Program.

9. Electric Power

10. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)

11. Photo Lab. Facilities

12. Fire fighting equipment adequate for all possible emergencies during this type of test program.

13. First Aid and Emergency Hospital Facilities.

NOTE: Items No. 2, 3, and 4 may be omitted if Security provisions as shown on Drwg. 500504 are not required.

Change ——— ————— AVGAS MIL. Spec. 5572

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned. A Final Report of tests will be submitted to Customer.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel and Dural fabrication and erection
(b) Motor driven hoist assembly and installation
(c) Fabric (canvas) curtain manufacture and installation

11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's ~~and~~ Navy's Pilot Familiarization Program.
A Navy Evaluation Program if required will be separately quoted.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Model 5, Ship Number One, completely assembled except for propellers, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls

   Snubbing Cylinders (2)

   Counter Balance Cable Snubber

   Tail Cable Snubber

2. Hoist Beam Structure

3. Security Provisions (See Drwg. 500504) Maximum Requirements

   (a) Curtain Enclosures for entire test area
   (b) Alternate - Omit curtain enclosure.

13. MAJOR PURCHASED ITEMS REQUIRED: (Cont'd)

4. (a) 250 Feet of Cyclon Fencing. This purchased fencing plus fencing supplied by Navy at Moffett Field to be installed and priced as one contract.

(b) Alternate - Omit all fencing (Test area to be patrolled by Marine Guards)

5. Floor Protection. (See Rev. Drawing 5-02104) A 1/4" steel plate 12 feet square (one piece) shall be placed on existing concrete floor. Thermal insulation to be installed between steel plate and concrete floor.

Note: The above items will be manufactured and installed by Subcontractors by Personnel approved under Security Regulations. Sub-Contractors will be required to make available their representative at such times as believed necessary by Convair Test Supervisor. All Installations may be removed after test program is completed at customer's option, test installations may be left in place for future use. To be priced each way.

14. CAPITAL FACILITIES REQUIRED:

Requirements are to ~~be determined and separate list submitted.~~
Use existing

15. PROPOSED PROGRAM SCHEDULE:

A. Engineering Final Release 1 June 1953

B. Tooling and Manufacture Completion 1 August 1953

C. Flight Program ~~Completion~~ -- 3 months elapsed time.
Note: 2 weeks additional required before and after flight program for shipment of test airplane to Moffet Field and return to San Diego.
~~December 15, 1953 -- Pending availability of engine in June 1953.~~

16. APPLICABLE SPECIFICATIONS OR DESCRIPTIVE DATA AVAILABLE FOR ESTIMATING PURPOSES:

1. Drwg. 5-02104 "Proposal - XFY-1 Tethered Flight" Change "A"
2. "Moffett Field Trip Report" dated 29 November 1952
3. "Problem Statement Outline" date 23 December 1952
4. "Hoisting Test Rig for Installation in Moffett Field Hanger" ZM-5-027
5. Cost Proposal Outline Serial No. 50-156-3 dated 11 March 1953 -Rev.10 Apr.1953
6. Security Provisions Drwg. 500504

Rev. 27 April 1953

17. ENGINEERING COORDINATOR ASSIGNED: ~~[illegible] Suggs~~ PHONE NO. W-6511
Ext. 1764

18. SCHEDULE FOR DEPARTMENTAL COST ESTIMATES AND DATA TO BE SUBMITTED TO CONTRACTS DEPARTMENT (to be supplied by Contracts Department or arrived at in proposal meeting)

LM:DKF:vj

Prepared by:
ENGINEERING PLANNING AND ESTIMATING

cc: J. H. Famme
C. B. Carroll/D. Suggs
W. W. Withee
J. L. Wainwright
R. White
P. D. Ferrara
G. W. O'Hare
J. C. Hoover
L. O. Cederwall
H. F. VonGoodat
W. J. Wood
R. L. Bayless
G. G. Green
R. H. Shick
M. Dublin
H. F. Dunholter
C. F. McCabe
R. A. Ackley
E. F. Strong
R. B. Thompson
W. S. Ivans
J. J. Alkazin
L. J. Bordelon
H. R. Kennedy
E. D. Shannon
W. Martin
A. B. McFarland
R. C. Pederson

FEB 11 1954

CONFIDENTIAL
SECURITY INFORMATION

CONVAIR - San Diego

CONFIDENTIAL
SECURITY INFORMATION

9 February 1954

R. C. Pedersen

Contract NOas 51-936-c - Model XFY-1 Aircraft
Shipment of the No. 1 airplane and Equipment to Moffett Field -
Request for Cost Estimate of

1. It is possible that the Navy may not be able to transport by water the subject airplane and equipment to Moffett Field. Therefore, it is necessary that an estimate be made at the earliest possible date of the cost involved in shipping by motor transport.

2. The subject contract does not include cost for transportation of the subject airplane and equipment. Therefore, if Convair is to assume this responsibility, it is necessary that we advise BuAer as soon as possible of the additional funds required for this purpose.

CW Power
C. W. Power
Navy Contracts Administration Supervisor

EF:mon

cc: C. B. Carroll
L. Moore
J. Herbig
A. D. Shawkey
C. W. Power (3)
51-936 Chron

Info

NOTE & RETURN TO
DATE
1
Lambert
Moore 2/15
~~Dempsey~~
10 #50-156-3
11

File #50-156-3

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego Division - San Diego, California

EWF:rs
11-4-6449
28 December 1953

CONFIDENTIAL

To: Bureau of Aeronautics Representative
Consolidated Vultee Aircraft Corporation
San Diego, California

Subj: Contract NOas 51-936-c - Model XFY-1 Airplane - Transporting to NAS, Moffett Field for Tethered Flight

Ref: (a) Convair ltr. 11-4-4797 dated 11 May 1953.

Encl. (1) Model XFY-1 CVAC Dwg. No. 5-00001
(2) Model XFY-1 CVAC Photograph of Handling Cart

1. Reference (a), Contractor's accepted proposal for the tethered flight program at NAS, Moffett Field, is predicated upon the Government furnishing transportation of the airplane and associated equipment from Contractor's plant to Moffett Field and return. It is anticipated such transportation will be accomplished by water.

2. Barring unforeseen technical difficulties Contractor estimates that the XFY-1 airplane will be ready for transporting to Moffett Field during the period of 1 to 10 February 1954. The duration of the project at Moffett Field is estimated upon an elapsed calendar time of four months.

3. To assist in your arranging for the transportation of the XFY-1 airplane as set forth in paragraph 6 (a) of reference (a), enclosures (1) and (2) are submitted herewith. The weights and dimensions of the airplane and handling cart are set forth on these enclosures. The airplane is to be removed from the handling cart during shipment. The tongue of the handling cart may be removed during shipment. The length of the handling cart as set forth on enclosure (2) does not include the tongue.

4. Contractor's proposal, reference (a), does not include cost for dismantling airplane or handling cart at Contractor's plant prior to shipment nor costs for assembling these items at Moffett Field. Shipment requiring dismantling and reassembly would increase the estimated cost and fixed fee of subject contract.

5. Contractor will be pleased to furnish any other information pertaining to the items listed under paragraph 6 of reference (a).

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego Division

for Dudley H. Digges
Manager of Contracts

cc: C. B. Carroll (2)
L. Moore
C. W. Power (3)
File 51-936-c

CONFIDENTIAL

JAN 5 1954

NOTE & RETURN TO

		INIT.	DATE
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4	Lambert	[illegible]	[illegible]
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7			
8	Dawsey	WFD	1-12
9			
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11	File 50-156-3		

CONVAIR

12/22/53

MEETING ON MODEL 5 TETHERED FLIGHT PROGRAM

A meeting was held in the Model 5 Project Office 12/22/53 to review the present status of the various phases of this program and to outline plans for accomplishment of the work remaining to be done, both here and at Moffett.

Those present were Mr. C. B. Carroll, J. O. Pike, E. W. Fowler, R. C. Lambert and D. B. Suggs.

The cost proposal letter dated 11 May 1953, which outlines the general requirements of the program, gives a cost breakdown and lists government furnished items, was reviewed. The sales order No. 150-1-45 dated 21 September was also reviewed.

It was agreed that Mr. Lambert would make a check to determine the hours expended to date by Engineering and Shop on the various work orders (W.O.9195, 9198 and 9199). This will be converted to dollars and subtracted from the total estimated cost, $460,100.00 less $99,920.00 subcontract cost to determine the amount of money remaining to be spent. The operation and the number of personnel required will be limited to this amount.

Mr. Fowler will followup on shipping requirements and government furnished items through the BAR Office. It was pointed out by Mr. Fowler that no fees are provided in the cost breakdown for shipment of mechanics personal tool boxes, etc., unless they are shipped with the airplane and related parts in the initial shipment. This would be unsatisfactory as they would be tied up for approximately one week in transit. It was therefore recommended that these be carried by the mechanic and that his travel order be written to cover any such excess baggage fees.

C. B. Carroll
Project Engineer

CBC:DBS:rb

cc: Mod. 5 P/O
E.W. Fowler
R.C. Lambert
D.B. Suggs (2)

DEC 29 1953

NOTE & RETURN TO

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7	Dawsey	WGD	12/30
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10			
11	File 50-156-3		

Date: 22 September 1953

To: Departments Concerned

Subject: Model 5 Captive Flight Test Program - Contract NOas 51-936-c

Reference: Sales Order 150-1-45, revised September 21, 1953

Work Order numbers 9195, 9198 and 9199 have been assigned to accumulate the cost of the subject program. Costs are to be accumulated to conform with the breakdown of costs included in the proposal submitted for this item of work. Referenced Sales Order outlines the costs to be charged to each of the Work Orders listed above.

H. E. Harrison

HEH/bu

cc: Timekeeping
Industrial Accounting
General Accounting
Engineering
Material
Budgets
Estimating
Performance Reporting
Contracts
Factory Methods and Work Standards
Plant Engineering
Manufacturing Control

SEP 25 1953

NOTE & RETURN TO

		INIT.	DATE
1			
2	Stutzman		9/23
3			
4	Perkins		
	[illegible]		
	File #50-156-3		

MAY 14 1953 PtE

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego Division - San Diego, California

CONFIDENTIAL
SECURITY INFORMATION

LML:mmk
11-4-4797
11 May 1953

To: Chief, Bureau of Aeronautics
Navy Department
Washington 25, D. C.

Via: Bureau of Aeronautics Representative
Consolidated Vultee Aircraft Corporation
San Diego 12, California

Subj: Contract NOas 51-936-c - Model XFY-1 Airplanes
Tethered Flight Tests at Moffett Field - Proposal for

Ref: (a) BuAer Conf ltr 019742 dated 10 October 1952

Encl: (1) CVAC Drawing 5-00524 (3 copies)
(2) CVAC Drawing 5-00504 (3 copies)
(3) Estimated Cost Breakdown

1. As heretofore informally discussed between BuAer and Contractor personnel, Contractor proposes to conduct a pilots familiarization and test program inside a hangar at Moffett Field with equipment generally in accordance with enclosure (1). Reference (a) granted permission to use a hangar at Moffett Field for the purposes of such tests.

2. The restrained hovering flight tests are to be accomplished by securing the airplane with cables to limit the operation. The tethered flight gear will be so designed as to automatically prevent the airplane from exceeding a predetermined rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted. The purpose of this program is to develop pilot technique in landing, and to demonstrate the ability of the pilot to take off, hover in vertical flight and land safely.

3. The instrumentation to be installed will be the same as used in the flight demonstration, primarily for the purpose of monitoring safe operation of the power plant control system in the airplane. The operation will be photographed with normal and slow motion moving picture cameras. Adequate vibration warning devices will be installed in the cockpit and radio communication will be provided between the pilot and the ground operator of the tethering equipment. Wind conditions will not be explored. In the hangar the tests will be accomplished without an autopilot.

INIT DATE
~~Perkins~~ 5/14
File 50-1563

CONFIDENTIAL
SECURITY INFORMATION

4. Duration of the project at Moffett Field is predicated upon an elapsed calendar time of four months, the first two weeks being allocated to readying the aircraft equipment, shipment and set-up at the base; the following three months will cover the tethered flight tests; and the last two weeks will be utilized for closing base requirements and the return of aircraft and equipment to the Contractor's facility. The flight program is based on 25 hours flight time and fuel and oil estimate is prepared on a total of 50 hours engine operation.

5. A static test of the facility at Moffett Field will be conducted by a subcontractor. This task will be to supply a deadweight fixture capable of containing 48,000 lbs. Water is to be used as ballast. Water will be added in increments, and deflection of the hangar will be measured for each increment of load.

6. This proposal is predicated upon the following government furnished items:

a. Transportation of the airplane and associated equipment from Contractor's plant to Moffett Field and return. It is anticipated such transportation will be accomplished by water.

b. Monorail cars and four operators to assist the subcontractor and Contractor in setting up tethered flight test equipment.

c. A partitioned office at the east side of the hangar between Arches 2 and 3.

d. A partitioned room on the second deck, east side, for use as an observer's station.

e. Marine or Naval guard for security purposes as required by BuAer during entire test program.

f. Electrical power and air supply.

g. Photo laboratory facilities, including cameraman, films and developing.

h. Fire fighting equipment adequate for all possible emergency during the test program.

i. First aid and emergency hospital facilities.

j. Shop supplies such as AN standards, raw stock, brakes, drawings, etc.

k. Housing at Moffett Field for Contractor personnel.

l. Jet fuel.

6. (Cont'd)

m. If the alternate security provisions shown on enclosure (2) are effected, four (4) mooring masts, approximately 170 ft. of 8 ft. "cyclone" wire fence and three (3) 30 ft. sections and two (2) 24 ft. sections of movable fence to be used as gates.

7. Contractor will supply special tools and ground handling equipment, shop employees tool kits, office supplies and equipment, spare parts, synthetic oil and precision devices required for the test. This proposal does not include an allowance for reimbursement of expenditures incurred by the Bureau, nor has an allowance been made for replacement of parts and materials necessitated by short life period when the airplane is using synthetic EEL-3A oil. In the event that erection of "cyclone" fencing and curtain enclosures for the entire area are required to effect security in accordance with enclosure (2), the subcontractor cost will be increased by $15,000.

8. The Contractor will supply the necessary mechanics and electricians to maintain, service and repair the airplane at Moffett Field. The Contractor will also supply the peculiar spare parts, fittings, tools and equipment to maintain a shop at Moffett Field. The shop facilities are to be made available at Moffett Field. All modification, repair, assembly and disassembly work will be accomplished under established shop and inspection practices.

9. As indicated in enclosure (3), accomplishment of the Moffett Field tethered flight tests will result in estimated cost of $486,845.32, including fixed fee of $26,745.32. It is requested that this proposal be formalized in a forthcoming contractual amendment and that in the event the Bureau considers this proposal favorably, advance authorization by dispatch be given to the Contractor so that the procurement of the subcontracted items may be initiated to avoid delay in the program.

CONSOLIDATED VULTEE AIRCRAFT CORPORATION

RCSebold
R. C. Sebold
Vice President - Engineering

cc: Wash. Ofc. (2) 51-936-c Chron
C. B. Carroll
J. Blakely
R. C. Pederson
L. Moore
D. Suggs
A. Shawkey
C. W. Power (2)

Enclosure (2) to
11-4-4797

MODEL XFY-1 - TETHERED FLIGHT TEST AT MOFFETT FIELD
ESTIMATED COST BREAKDOWN

Item #1 - Services Required to Ready Aircraft, Special Tools & Equipment for Delivery to and Return from Moffett Field

Engineering Labor	110 hrs.	@ $2.68/hr.	$ 294.80
Engineering Overhead	110 hrs.	@ 2.33/hr.	256.30
Engineering Premium	15 hrs.	@ 1.27/hr.	19.05
Experimental Labor	2,800 hrs.	@ 1.98/hr.	5,544.00
Experimental Overhead	2,800 hrs.	@ 2.26/hr.	6,328.00
Experimental Premium	560 hrs.	@ .99/hr.	554.40
Raw Material & Purchased Parts			525.00
Total Estimated Cost Item #1			$ 13,521.55

Item #2 - Design of Test Installation & Airplane Modification

Engineering Labor	8,750 hrs.	@ $2.68/hr.	$ 23,450.00
Engineering Overhead	8,750 hrs.	@ 2.33/hr.	20,387.50
Engineering Premium	1,315 hrs.	@ 1.27/hr.	1,670.05
Experimental Labor	1,450 hrs.	@ 1.98/hr.	2,871.00
Experimental Overhead	1,450 hrs.	@ 2.26/hr.	3,277.00
Experimental Premium	290 hrs.	@ .99/hr.	287.10
Raw Material & Purchased Parts			2,700.00
Direct Charges			140.80
Total Estimated Cost Item #2			$ 54,783.45

Item #3 - Accomplishment of Test Program at Moffett Field

Engineering Labor	22,940 hrs.	@ $2.68/hr.	$ 61,479.20
Engineering Overhead	22,940 hrs.	@ 2.33/hr.	53,450.20
Engineering Premium	4,980 hrs.	@ 1.27/hr.	6,324.60
Experimental Tooling Labor	660 hrs.	@ 1.98/hr.	1,306.80
Experimental Tooling Overhead	660 hrs.	@ 2.26/hr.	1,491.60
Experimental Tooling Premium	132 hrs.	@ .99/hr.	130.68
Experimental Tooling Material			600.00
Experimental Mfg Labor	3,340 hrs.	@ 1.98/hr.	6,613.20

Item #3 - Accomplishment of Test Program at Moffett Field (Cont'd)

Experimental Manufacturing Overhead	3,340 hrs.	@ $2.26/hr.	$ 7,548.40
Experimental Manufacturing Premium	668 hrs.	@ .99/hr.	661.32
Experimental Maintenance Labor	21,850 hrs.	@ 1.98/hr.	43,263.00
Experimental Maintenance Overhead	21,850 hrs.	@ 2.26/hr.	49,381.00
Experimental Maintenance Premium	4,745 hrs.	@ .99/hr.	4,697.55
Experimental Flight Test Labor	75 hrs.	@ 3.35/hr.	251.25
Experimental Flight Test Overhead	75 hrs.	@ 9.63/hr.	722.25
Subcontract			90,000.00
Per Diem			50,030.00
Transportation			3,380.00
Raw Material & Purchased Parts			8,785.00
Rental 2 Cars			1,225.00
Direct Charges			453.95
Total Estimated Cost Item #3			$391,795.00
Total Estimated Cost Items #1, #2, & #3			460,100.00
Fixed Fee @ 6% (costs less premium pay)			26,745.32
Total Estimated Cost Plus Fixed Fee			$486,845.32

CONVAIR

Date: 14 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference:
(a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
(b) Minutes of Model 5 Flight Test Program Meeting of 6 March 1953
(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953
(d) Memo J. F. Schirtzinger to R. C. Pederson dated 10 April 1953

Enclosure:
(A) Cost Proposal Outline Serial #50-156-3 as revised 14 April 1953

(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A) which has been revised to reflect deletion of certain Engineering tasks which are now sub-contracted.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	$5.01	100	Man Hours	$ 501
Materials & Direct Charges				$ 25
Experimental Mfg. Labor	$4.24	~~3,000~~ 2,800	Man Hours	$12,720

2800 hr

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	$5.01	9,333	Man Hours	$ 46,758
Materials & Direct Charges				$ 2,240
Experimental Tooling Labor	@ $4.24	110	Man Hours	$ 470
Experimental Mfg. Labor	@ $4.24	1,485 1,445	"	$ 6,296

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

RETURN TO
INIT. DATE

Notes: (2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

(3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data	@$5.01	19,400	Man Hours	$ 97,194
Materials & Direct Charges				$ 4,673
Experimental Tooling Labor	@ $4.24	~~1,300~~ 660	Man Hours	$ 5,512
Experimental Mfg. Labor	@ $4.24	9,400 3,840	"	$ 39,856
Experimental Maintenance & Repair	@4.24	20,500 21,350	"	$ 86,920
Flight Test Ground Hours		25		
Flight Test Flying Hours		25		
Total Test Hours		50 @ $16.00		$ 800
Fuel (Gal./Hr.) 420 x 50 Hrs.	@$.22/g	121,000	Gal.	$ 4,620
Oil (Gal./Hr.) 1 x 50 Hrs.	@$12/gl	50	"	$ 660
Per Diem Allowance	@ $9.00	4,535		$ 40,815

2,800
1,650
660
3,840
21,350
30,100 MH

CHANGES MADE IN [illegible] FIGURES SUBMITTED BY JOE JAMES
J.W.J.D.,
5-15-53

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

(7) It is anticipated that Engineering Department will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,645 Engineering Man Hours and 3,215 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/H. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore (2) ✓
Engr. Files

Note: This memo supersedes information previously submitted in reference (d).

3600
11400
10500
32900
2895
35795

1595 Tooling
1300 "
2895 "

Serial No. 50-156-1

Date: 11 March 1953
Revised: 10 April 1953

COST PROPOSAL OUTLINE

REVISED 27 APRIL 1953

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

PILOT'S FAMILIARIZATION PROGRAM

1. PROPOSAL REQUESTED BY:

Model 5 Project Office (C. B. Carroll) - Confidential Memo to L. Moore dated 23 December 1952. Minutes of Model 5 Minimum Flight Test Program Meeting dated 6 March 1953.

2. FOR SUBMITTAL TO:

BuAer

3. DATE PROPOSAL IS TO BE SUBMITTED:

To be determined by Contract Department.

4. TYPE OF BID DESIRED:

Firm

5. TYPE OF CONTRACT CONTEMPLATED:

Amendment to NOa(s) 51-936-c (CPFF)

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight.

The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES: (Cont'd)

The tethered flight gear should be so designed as to automatically prevent the airplane exceeding 8 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted.

The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

No test data not required for the above is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

No telemetering will be required for the test program at Moffett Field and no instrumentation wires would be required from the airplane. Adequate vibration warning devices would be installed in the cockpit and visual observation would be made during flight.

Radio communication will be provided between the pilot and the ground operator of the tethering equipment.

Wind conditions will not be explored in hangar.

The minimum Moffett Field program will be without autopilot.

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES (Cont'd)

The program and alternates to program for which cost estimates are to be submitted to the Customer are as follows:

A. Pilot's Familiarization Program Consisting of:

(1) Delivery and shipment of the airplane in accordance with Item 12.

(2) Design of test installations in accordance with Item I Engineering Design Task of the Detail Work Statement and Subcontract fabrication and erection of the installations including the Security provisions as described in Major Purchased Items Required, item 3a, and 4a and modification of the airplane in accordance with Item II.A. of the Detail Work Statement.

Note: Alternate figures are to be submitted for accomplishing this phase of the program with Security provisions deleted as described in Item 3b and 4b.

(3) Accomplishment of Test Program as outlined in the Detail Work Statement including Liaison and Maintenance and preparation of reports.

Note: Transportation for Convair Personnel at Moffett Field to be provided. It is assumed that transportation will be rented.

Note: Personnel assigned to Moffett Field test will be on a per diem basis. Living quarters will be arranged for at or near Moffett Field. (San Jose and/or Palo Alto.)

7. DETAIL WORK STATEMENT

I Engineering Design task is as follows:

A. Proposal and General Study

B. Hoist and Tethering Controls Installation

(a) Hoisting Mechanism

(b) Counter Balance Mechanism

(c) Automatic Control Equipment

(d) Reels and Brake

(e) Cable Assemblies

(f) Pneumatic Snubber for Nose Cable

(g) Pulleys, Idlers and Mounting

(h) Tethering Line Installation

C. Hoisting Beam Installation

(a) Beam Structure

(b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation

(a) Curtains at Arch 3, Doors and Corridor

(1) Curtain Catenary and Support Cables

(2) Curtain Reinforcement and Support Fittings

(3) Curtain Support Beam and Mast Rework

(b) Cyclone Fence Installation

(1) At Arch 3

(2) At corridor

(3) At doors

7. DETAIL WORK STATEMENT (Cont'd)

E. Airplane Modifications

(a) Cable Attachment at Nose

(b) Tethering Line Attachment

(c) Installation of Tethering and Brake Controls

(d) Plane to Ground Communications

F. Procurement, Release and Check

G. Installation Liaison

(a) Mechanical

(b) Electrical

7. DETAILED WORK STATEMENT (Cont'd)

II. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to hoist and controls to accomplish Tethered or Captive condition.

B. Supply mechanics and electricians to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply spare parts, fittings, tools and equipment to maintain a "Shop" at Moffett Field. Shop facilities will be made available by the Navy at Moffett Field.

D. Maintain, service and repair tethering equipment during test program.

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department will be required to handle this task.

F. Proof Loading Test of Hangar and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hangar structure and Hoist during the tethered flight test.

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practices. Two (2) full time inspectors will be required at Moffett Field for this purpose.

~~G. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus securing an erector.~~

7. DETAIL WORK STATEMENT (Cont'd)

III. Experimental Flight Work Statement

A. The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

B. The tethered flight gear should be so designed as to automatically prevent the airplane exceeding ~~8~~ 20 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted. BRAKING ACTION MAY BE APPLIED BY RIG OPERATOR TO PREVENT AIRPLANE FROM EXCEEDING 8 FT. PER SECOND OR ANY DESIRED RATE OF SINK.

C. The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

D. ~~No~~ Test data, OTHER THAN THAT REQUIRED ~~not required~~ for the above, is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

7. DETAIL WORK STATEMENT

IV. Aerodynamics Group

1. ~~A description of the aerodynamics task associated with the [illegible] flight program (reference (a)) is given below:~~

   ~~A. Investigate the items associated with design of tethering system in order to insure that mechanical restraints do not seriously affect flight hovering characteristics.~~

   ~~B. Make preliminary investigation of critical hovering stability characteristics from visual observations, film records and pilot observations, make studies necessary to improve possible undesirable handling qualities.~~

   ~~C. Work with pilots to develop suitable take-off and landing techniques.~~

   ~~D. Perform work necessary to develop suitable [illegible] [illegible]~~

Aerodynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

V. Dynamics Group

Dynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

7. DETAIL WORK STATEMENT

VI. Instrumentation Group

The Instrumentation Group will be responsible for maintenance of instrumentation at Moffett Field as installed at San Diego, for minimum flight demonstration and pilot safety purposes.

Maintenance will include airborne equipment and also operation of ground data recording cameras.

7. DETAIL WORK STATEMENT (Cont'd)

VII. Engineering Test Laboratory

~~1. Engineer methods and means for obtaining all dynamic flight data required.~~

~~2. Engineer methods and means for obtaining temperature data as directed by the Experimental Flight Group.~~

~~3. Design calibration means and procedures, also auxiliary equipment as required.~~

~~4. Calibrate all dynamic pickups and associated recording equipment.~~

~~5. Take dynamic data and temperature data throughout the program. Edit data and provide preliminary analysis preparatory to presentation to Experimental Flight Department for detailed analysis and report.~~

~~6. The foregoing dynamic test procedures will be applied specifically to the following scheduled operations only:~~

~~Flight operational techniques.~~

~~Pilot familiarization operations.~~

A. ~~7.~~ Static Test of facility at Moffett Field. This task will be to supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast. Proof load to be applied as follows:

(a) The empty tank will be raised a short distance above floor by means of the tethered gear.

(b) Water will be added in increments of 48,000 pounds proof load and deflection of the hanger will be measured for each increment of load.

Note: The following items, which may come up in the course of this program are not to be included in this proposal but are to be quoted on separately after the requirements have been determined.

(a) Dynamic tests found to be necessary as a result of investigation of operational techniques or of pilot familiarization operations.

(b) Tests on airplane characteristics with or without Auto Pilot.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

1. North end of Hanger to Arch #3 except Shop area along West side.

2. Four (4) Mooring Masts

3. 8 Foot "Cyclone" wire fence (approx. 170 Ft.).

4. 3 - 30 Ft. Sections and 2 - 24 Ft. Sections of movable fence to be used as gates.

5. Monorail Cars and operators (4) to assist subcontractor and Convair in setting up Tethered Flight Test equipment.

6. Partitioned Office at East Side of Hanger between Arch #2 and #3.

7. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.

8. U. S. Marine Corps Guard for Security during entire Test Program.

9. Electric Power

10. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)

11. Photo lab. Facilities

12. Fire fighting equipment adequate for all possible emergencies during this type of test program.

13. First Aid and Emergency Hospital Facilities.

NOTE: Items No. 2, 3, and 4 may be omitted if Security provisions as shown on Drwg. 500504 are not required.

— AVGAS MIL. SPEC 5572

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned. A Final Report of tests will be submitted to Customer.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel and Dural fabrication and erection
(b) Motor driven hoist assembly and installation
(c) Fabric (canvas) curtain manufacture and installation

11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's ~~and Navy's~~ Pilot Familiarization Program.
A Navy Evaluation Program if required will be separately quoted.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Model 5, Ship Number One, completely assembled except for propellers, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls

   Snubbing Cylinders (2)

   Counter Balance Cable Snubber

   Tail Cable Snubber

2. Hoist Beam Structure

3. Security Provisions (See Drwg. 500504) Maximum Requirements

   (a) Curtain Enclosures for entire test area
   (b) Alternate - Omit curtain enclosure.

13. MAJOR PURCHASED ITEMS REQUIRED: (Cont'd)

4. (a) 250 Feet of Cyclon Fencing. This purchased fencing plus fencing supplied by Navy at Moffett Field to be installed and priced as one contract.

(b) Alternate - Omit all fencing (Test area to be patrolled by Marine Guards)

5. Floor Protection. (See Rev. Drawing 5-02104) A 1/4" steel plate 12 feet square (one piece) shall be placed on existing concrete floor. Thermal insulation to be installed between steel plate and concrete floor.

Note: The above items will be manufactured and installed by Subcontractors by Personnel approved under Security Regulations. Sub-Contractors will be required to make available their representative at such times as believed necessary by Convair Test Supervisor. All Installations may be removed after test program is completed at customer's option, test installations may be left in place for future use. To be priced each way.

14. CAPITAL FACILITIES REQUIRED:

Requirements are to be determined and separate list submitted.

15. PROPOSED PROGRAM SCHEDULE:

A. Engineering Final Release 1 June 1953 ✓

B. Tooling and Manufacture Completion 1 August 1953 ✓

C. Flight Program ~~Completion~~ - 3 MONTHS ELAPSED TIME.

Note: 2 WEEKS ADDITIONAL REQUIRED BEFORE AND AFTER FLIGHT PROGRAM ~~December 15, 1953 - Pending availability of engine in June 1953.~~ FOR SHIPMENT OF TEST AIRPLANE TO MOFFET FIELD AND RETURN TO SAN DIEGO

16. APPLICABLE SPECIFICATIONS OR DESCRIPTIVE DATA AVAILABLE FOR ESTIMATING PURPOSES:

1. Drwg. 5-02104 "Proposal - XFY-1 Tethered Flight" Change "A"
2. "Moffett Field Trip Report" dated 29 November 1952
3. "Problem Statement Outline" date 23 December 1952
4. "Hoisting Test Rig for Installation in Moffett Field Hanger" ZM-5-027
5. Cost Proposal Outline Serial No. 50-156-3 dated 11 March 1953 -Rev.10 Apr.1953
6. Security Provisions Drwg. 500504

17. ENGINEERING COORDINATOR ASSIGNED: D. B. Suggs PHONE NO. W-6611
Ext. 1766

18. SCHEDULE FOR DEPARTMENTAL COST ESTIMATES AND DATA TO BE SUBMITTED TO CONTRACTS DEPARTMENT (to be supplied by Contracts Department or arrived at in proposal meeting)

Prepared by:
ENGINEERING PLANNING AND ESTIMATING

LM:DMF:vj

cc: J. H. Famme
C. B. Carroll/D. Suggs
W. W. Withee
J. L. Wainwright
R. White
P. D. Ferrara
G. W. O'Hare
J. C. Hoover
L. O. Cederwall
H. F. VonGoodat
W. J. Wood
R. L. Bayless
G. G. Green
R. H. Shick
M. Dublin
H. F. Dunholter
C. F. McCabe
R. A. Ackley
E. F. Strong
R. E. Thompson
W. S. Ivans
J. J. Alkazin
L. J. Bordelon
H. R. Kennedy
E. D. Shannon
W. Martin
A. B. McFarland
R. C. Pederson

L. Moore

CONVAIR

Date: 14 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference:
(a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
(b) Minutes of Model 5 Flight Test Program Meeting of 6 March 1953
(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953
(d) Memo J. F. Schirtzinger to R. C. Pederson dated 10 April 1953

Enclosure:
(A) Cost Proposal Outline Serial #50-156-3 as revised 14 April 1953
(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A) which has been revised to reflect deletion of certain Engineering tasks which are now sub-contracted.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	100 Man Hours	
Materials & Direct Charges		$ 25
Experimental Mfg. Labor	3,000 Man Hours	

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	9,333 Man Hours	
Materials & Direct Charges		$ 2,240
Experimental Tooling Labor	110 Man Hours	
Experimental Mfg. Labor	1,485 " "	

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

Notes: (2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

(3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data		19,400 Man Hours	
Materials & Direct Charges			$ 4,673
Experimental Tooling Labor		1,300 Man Hours	
Experimental Mfg. Labor		9,400 " "	
Experimental Maintenance & Repair		20,500 " "	
Flight Test Ground Hours	25		
Flight Test Flying Hours	25		
Total Test Hours	50		
Fuel (Gal./Hr.) 420 x 50 Hrs.		21,000 Gal.	
Oil (Gal./Hr.) 1 x 50 Hrs.		50 "	
Per Diem Allowance		4,535	

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUAER for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

(7) It is anticipated that Engineering Department will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,645 Engineering Man Hours and 3,215 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/M. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore (2)
Engr. Files

Note: This memo supersedes information previously submitted in reference (d).

CONVAIR

to File
50-156-3

Date: 10 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference:
(a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
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Enclosure:
(A) Cost Proposal Outline Serial #50-156-3 as revised 10 April 1953

(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A). Estimate is presented in breakdown form to facilitate compilation of total program costs by totalling the pertinent phase costs.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	100 Man hours	
Materials & Direct Charges		$ 25
Experimental Mfg. Labor	3,000 Man hours	

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	9,700 Man hours	
Materials & Direct Charges		$ 3,120
Experimental Tooling Labor	110 Man hours	
Experimental Mfg. Labor	4,400 " "	

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

(2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

To: R. C. Federson 10 April 1953

Notes: (3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data		20,100 Man hours	
Materials & Direct Charges			$ 5,630
Experimental Tooling Labor		1,300 Man hours	
Experimental Mfg. Labor		9,400 " "	
Experimental Maintenance & Repair		20,500 " "	
Flight Test Ground Hours	25	31,200	
Flight Test Flying Hours	25	[illegible] TEST [illegible]	
Total Test Hours	50	33,71[illegible]	
Fuel (Gal./Hr.) 420 x 50 Hrs.		21,000 Gal.	
Oil (Gal./Hr.) 1 x 50 Hrs.		50 "	
Per Diem Allowance		4,520	

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) Report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

(7) It is anticipated that Engineering Department will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

To: R. C. Pederson 10 April 1953

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,975 Engineering Man Hours and 3,485 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/N. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore
Engr. Files

NOTE & RETURN TO
RM 4/13
~~Stutzman~~ RH 4/13
~~R Perkins~~ JP
~~Mowry~~ M 4-20
Dawsey
File 50-156-3

26925

L. moore

CONVAIR

Date: 14 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference:
(a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
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(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953
(d) Memo J. F. Schirtzinger to R. C. Pederson dated 10 April 1953

Enclosure:
(A) Cost Proposal Outline Serial #50-156-3 as revised 14 April 1953

(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A) which has been revised to reflect deletion of certain Engineering tasks which are now sub-contracted.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	$5.01	100	Man Hours	$ 501
Materials & Direct Charges				$ 25
Experimental Mfg. Labor	$4.24	~~3,000~~	Man Hours	~~$12,720~~

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	$5.01	9,333	Man Hours	$ 46,758
Materials & Direct Charges				$ 2,240
Experimental Tooling Labor	@ $4.24	110	Man Hours	$ 470 ✓
Experimental Mfg. Labor	@ $4.24	1,485	" "	$ 6,296 ✓

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

Notes: (2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

(3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data	@$5.01	19,400	Man Hours	$ 97,194
Materials & Direct Charges				$ 4,673
Experimental Tooling Labor	@ $4.24	1,300	Man Hours	$ 5,512 ✓
Experimental Mfg. Labor	@ $4.24	9,400	" "	$ 39,856 ✓
Experimental Maintenance & Repair	@4.24	20,500	" "	$ 86,920 ✓
Flight Test Ground Hours	25			
Flight Test Flying Hours	25			
Total Test Hours	50	@ $16.00		$ 800
Fuel (Gal./Hr.) 420 x 50 Hrs.	@$.22/gl	21,000	Gal.	$ 4,620
Oil (Gal./Hr.) 1 x 50 Hrs.	@$12/gl	50	"	$ 60
Per Diem Allowance	@ $9.00	4,535		$ 40,815

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

(7) It is anticipated that Engineering Department will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,645 Engineering Man Hours and 3,215 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: R. W. Fink/N. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore (2)
Engr. Files

Note: This memo supersedes information previously submitted in reference (d).

CONVAIR

L. [illegible]
FILE
50-156-3

Date: 10 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference: (a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
(b) Minutes of Model 5 Flight Test Program Meeting of 6 March 1953
(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953

Enclosure: (A) Cost Proposal Outline Serial #50-156-3 as revised 10 April 1953

(B) Report DA5-153 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A). Estimate is presented in breakdown form to facilitate compilation of total program costs by totalling the pertinent phase costs.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	@$5.01	100 Man hours	$ 501
Materials & Direct Charges			$ 25
Experimental Mfg. Labor	@ $4.24	3,000 Man hours	$12,720

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	5.01	9,700 Man hours	$48,597
Materials & Direct Charges			$ 3,120
Experimental Tooling Labor	@ $4.24	110 Man hours	$ 470
Experimental Mfg. Labor	@ $4.24	4,400 " "	$18,656

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

(2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

To: R. C. Pederson 10 April 1953

Notes: (3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data	@ $5.01	20,100	Man hours	$100,701
Materials & Direct Charges				$ 5,630
Experimental Tooling Labor	@ $4.24	1,300	Man hours	$ 5,512
Experimental Mfg. Labor	@ $4.24	9,400	" "	$ 39,856
Experimental Maintenance & Repair	@ $4.24	20,500	" "	$ 86,920
Flight Test Ground Hours	25			
Flight Test Flying Hours	25			
Total Test Hours	50 @ $16.00			$ 800
Fuel (Gal./Hr.) 420 x 50 Hrs.	@ $.22/gl	21,000	Gal.	$ 4,620
Oil (Gal./Hr.) 1 x 50 Hrs.	@ $12/gl	50	"	$ 600
Per Diem Allowance	@ $9.00	4,520		$ 40,680

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) Report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

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To: R. C. Pederson   10 April 1953

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,975 Engineering Man Hours and 3,485 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/N. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore
Engr. Files

REV

FILE 50-156-3

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
SAN DIEGO DIVISION . . SAN DIEGO, CALIFORNIA

AVOID VERBAL ORDERS

TO Dave Faulk - Engr. Planning & Scheduling DEPT. 6 DATE 4-17-53

Subject: Model 5 Tethered Flight Tests

Ref: CPO 50-156-3 - Revised 14 April 1953

Change in Instrumentation Group task indicated in reference CP revision, affects our estimate submitted 3-16-53 as follows:

Item 1	Delete 600 MH Labor	
2	Delete ~~$1,500.00~~ 2500.00 Matl Cost	(BY PHONE TY KING 4/17/53 AND CONFIRMED 4/20/53 D.F.

SIGNED:	DEPT. & FUNCT.	ROOM	COL/STA	BLDG.	PLANT	PHONE
General Foreman - Instrumentation	6 27			51	1	1054 610/ph

FORM-1008-C (SHOW YOUR COMPLETE ADDRESS & PHONE)

PROPOSAL SERIAL No. 50-156-3

MODEL XFY-1 MODEL 5 TETHERED FLIGHT TEST-MOFFETT FIELD-PILOTS FAMILIARIZATION PROGRAM DATE 10 APRIL 1953 PAGE No.

REV. 15 APRIL 1953

		SHIPMENT [illegible]	DESIGN 9195	TEST 9100		MAN DAYS	
[redacted] DESIGN			7685	600		90	
WING							
TAIL							
HULL, FLOATS, FUSELAGE							
ARMAMENT							
LAND'G GEAR & MECHANISMS							
FURNISHINGS							
CONTROLS							
POWER PLANT							
HYDRAULICS, PNEUMATICS							
HEATING, VENTILATING, PRESS.							
ELECTRICAL							
INSTRUMENTS							
ELECTRONICS							
SUB-TOTAL MAN HOURS			7685	600		90	
STRUCTURES-STRESS		100	700	400		30	
WEIGHTS				200			
CHECKING							
LINES							
LOFTING							
ISOMETRICS							
AERODYNAMICS				900		75	
DYNAMICS				900		75	
HYDRODYNAMICS							
THERMODYNAMICS				200		5	
PROPULSION LAB (RAMP)				–		–	
ELECTRONICS LAB							
ENG. TEST LAB			100	–		15	
INSTRUMENTATION				2400		450	
ENG. TEST LAB. MATERIALS							
INSTRUMENTATION MATERIALS				$1000			
OPERATIONAL ANALYSIS							
LIAISON				3900		570	
SUB-TOTAL MAN HOURS			800	8900		1220	
TOTAL ENG. MAN-HOURS		100	8485	9500		1310	
ENG. MAT. & DIR. CHARGES		$ 25	$2240	$ 2705		–	
EXP. FACTORY MAN HOURS		2700	1350	27220		2625	(25 MEN 3½ MO)
EXP. FACTORY MATERIAL							
EXP. TOOLING MAN HOURS			110	1200			
EXP. TOOLING MATERIAL							
W/T HOURS OF OPERATION							
W/T MAN HOURS (DEPT. 61)							
FLIGHT TEST FLYING HOURS	@ $16/HR			25			
DATA ANALYSIS & COORD.				8200		600	
FUEL (GALLONS/HR.)	@ $.22/GAL			420			
OIL (GALLONS/HR.)	@ $.12/GAL			10			

NOTE: ALL DESIGN FUNCTIONS ARE COMBINED IN ONE SPECIAL DESIGN GROUP - WORK TO BE ACCOMPLISHED UNDER AWO # 9195 AND EWO # 1108 # 2054-01

CONTINGENCY OF 10% HAS BEEN ADDED TO THE HOURS INDICATED ON THIS SHEET IN THE MEMO TO PEDERSON DATED 10 APRIL 1953.

4535

$40815

PREPARED BY—

ENG. PLANNING & ESTIMATING

EXPERIMENTAL DEPARTMENT ESTIMATE

PROJECT
DESCRIPTION MODEL 5 (XFY-1 Tethered Flight Tests at Moffett Field --

SHIPMENT BY BOAT

COST P. O.
SERIAL NO. 50-156-3
DATED 1-15-53
EST. DATE 2-2-53
REVISED: 4-10-53

NO.	ITEM DESCRIPTION	TOOL DES. & PLANNING	TOOL MFG.	FAB. & ASSEMBLY	ENG'R'G. TESTS	W. T. MODELS	FLIGHT MAINT.	OTHER	TOTAL
9-IV	EXP. DEPT. TASK								
A	Modify #1 flight Article at San Diego, with such attachments as designed to fasten Airplane to hoist and controls to accomplish tethered or captive condition.								
	(1) Cable attachment at nose	40		500					540
	(2) Tethering line attachment	40		600					640
	(3) Install tethering and brake controls	10	20	150					180
	(4) Plane to ground communication (a) Telephone lines			100					100
* B	Maintain service and repair plane at Moffett field ~~including Tethering Equipment~~	200	1000	8520			(4 mo.)	18700	28420
	(1) Parts fabrication Convair S.D. peculiar								
* C	Supply/spare parts, fittings tools, and equipment to ~~maintain a "shop" at Moffett field~~ ~~(1) Parts Crib, work benches pneumatic guns, hose, drill motors, drill press grinder, band saw, locks~~	~~Nowry (Exp. to furnish list of Equip. Required)~~							
D	Delivery and Shipping							2700	2700
	Prepare for Shipping (1) Remove Props (2) Spray on one coat liquid envelope Reinstall Props								
√ ~~J~~	~~Proof Loading Test Rig~~			~~1500~~	~~1145~~	DELETED PER REVISED WORK STATEMENT DATED 4-15-53			~~2645~~
	Sub Total	290	1020	9870 ~~11370~~	~~1145~~			21400	32580 ~~35225~~
K	ALLOWANCE FOR CONTINGENCY 10%	29	102	987 ~~1137~~	~~115~~			2140	3258 ~~3523~~
	TOTAL D.L. HOURS	319	1122	~~12507~~		~~1260~~		23540	~~38748~~
	LABOR COST @ PER HOUR			10857					35838
	MATERIAL COST								
	TOTAL LABOR & MATERIAL COST								

DATA & CONDITIONS
(1) *B Includes only minor repairs to structure or Control Surfaces -- major components subject to future negotiation.
(2) *C Does not include Convair fabricated parts
(3) No. Men at Moffett 25 for Per Diem & Travel Expense
(4) This estimate based on a 50 - hour week
(5) Assistant Labor at S.D. - 15 men 3 Mo.

APPROVED:- A. B. McFarland
Experimental Superintendent

S. E. Nowry
Engineering Plan. & Est.

EXPERIMENTAL DEPARTMENT ESTIMATE

PROJECT DESCRIPTION MODEL 5 (XFY-1 Tethered Flight Tests at Moffett Field --

SHIPMENT BY BOAT

COST P. O.
SERIAL NO. 50-156-3
DATED 1-15-53
EST. DATE 2-2-53

NO.	ITEM DESCRIPTION	TOOL DES. & PLANNING	TOOL MFG.	FAB. & ASSEMBLY	ENGRG. TESTS	W. T. MODELS	FLIGHT MAINT.	OTHER	TOTAL
9-IV	EXP. DEPT. TASK								
A	Modify #1 flight Article at San Diego, with such attachments as designed to fasten Airplane to hoist and controls to accomplish tethered or captive condition. S.D.	TOOLING							
	(1) Cable attachment at nose	40		500					540
	(2) Tethering line attachment	40		600					640
	(3) Install tethering and brake controls	10	20	150					180
	(4) Plane to ground communcation RADIO (a) Telephone lines			100 1350					100 1460
* B	Maintain service and repair plane at Moffett field (1) Parts fabrication Convair S.D. (Includ. Tethering Equip.)	300	1500	12000 S.D.	34900		(4 mo.) ~~(7 mo.)~~	22900 ~~40075~~	36700 53875
* C	Supply spare parts, fittings tools, and equipment to maintain a "shop" at Moffett field (1) Parts Crib, work benches pneumatic guns, hose, drill motors, drill press grinder, band saw, locks	Nowry	-- (Exp. to furnish list of Equip. Required)						
D	Maintain, service and repair tethering equipment during test program			500 MOFFETT					500
E	Delivery and Shipping Instructions SHIPMENT								
	~~(1) Disassemble ship #1 at Convair, S.D.~~ LOADING ON DOCK TO BOAT			S.D. 1060 (Includes 1 coat liquid envelope)					1060
	~~(2) Crate~~			1500 (Props -- Service equipment)					1500
	~~(3) Reassemble plane for tests~~			2700					2700
	~~(4) After tests are completed, disassemble plane~~			1060					1060
	~~(5) Crate~~			1500					1500
	~~(6) Reassemble at Convair~~			S.D. 2700 10520					2700 10520
~~F~~	~~Pilots' escape provisions~~ ~~(1) Install hooks on the windshield structure above the pilots' seat~~			~~250~~ S.D.					~~250~~
G	Landing load test platform (Assist to E.T.L.)	Cancelled							
~~H~~	~~Assist to Instrumentation~~			500					500
~~I~~	~~Hoist Support Structure~~ ~~1000 # Al.Alloy~~ Struct.			~~8500~~ S.D.					8500
J	Proof Loading Test Rig			2645 1500	1145				2645
	TOTAL D.L. HOURS	390	1520	35120	1145		(4mo.)	22900	61075
	LABOR COST @ PER HOUR						(7mo.)	40075	78250
	MATERIAL COST								
	TOTAL LABOR & MATERIAL COST								

DATA & CONDITIONS

(1) *B. Includes only minor repairs to structure or Control Surfaces -- major components subject to future negotiation.

(2) *C. Does not include Convair fabricated parts

(3) No. Men at Moffett 25 for Per Diem & Travel Expense

(4) This estimate based on a 53 - hour week

50

17?

110
3825

10520
22900
51825

51825
16600
35225

250
500
8500
9250

APPROVED:— ABMcFarland
Experimental Superintendent

Engineering Plan. & Est.

HOISTING TEST RIG FOR INSTALLATION IN MOFFETT FIELD HANGAR

I. The hoisting test rig and balance system herein described shall consist of the following components:

1. Power Hoist Assembly
2. Counter Balance System
3. Controls and Panel
4. Load Stabilizing Cables
5. Shock Absorbing System

This equipment shall be installed in the Moffett Field Hangar No. 1 at Sunneyvale, California. It is to be complete with power hoist and counter-balance system with the necessary shock absorbers, cables, pulleys and hangar attachment parts, as shown in Fig. 1 and Convair drawings listed in the body of this spec.

The system shall have a service life of 500 hours. It shall be installed and rigged by the subcontractor to function as described herein.

1. Power Hoist

(a) Drum

The hoisting drum shall be as light weight as possible to reduce mass inertia when reversing direction of rotation at higher speeds. It shall be mounted on frictionless bearings and shall be dynamically balanced. It shall be constructed to dimensions given on Convair Drawing 5-00503, to accommodate a double 7/8 dia. hoisting cable for 168 ft. lift and 168 ft. of 5/8 dia. counter-balance cable. Each end of the hoisting cable shall be attached to opposite ends of the drum. The drum shall have 27 L.H. and 27 R.H. grooves for the 7/8 dia. cable. The center portion of the drum shall contain 27 R.H. grooves for the 5/8 dia. counter-balance cable with provisions for attachment of this cable toward the driven end of the drum.

(b) Cable System

(1) The hoisting cable shall be a double, 7/8 dia., 6 x 37 extra flexible, blue center steel hoisting cable. (Approximately 450 ft. required.)

(2) The counter-balance cable between the drum and the counter-weight shall be a single 5/8 dia. 6 x 37 extra flexible, blue center steel cable. (Approximately 250 ft. required.)

1. Power Hoist (cont'd)

(b) Cable System (cont'd)

(3) The counter-balance cable between the counter-weight and the bottom of the load shall be a double 1/2 dia. 6 x 37 extra flexible blue center steel cable. (Approximately 600 ft. required.)

(4) The side control cable shall be a single 5/16 dia. preformed 7 x 19 flexible carbon steel aircraft cable; Spec. MIL-C-1511. (Approximately 640 ft. required.)

(c) Motor and Gear Drive

The power hoist motor and gear drive shall be capable of hoisting the 13,000 pound load at a rate not less than 60 ft. or more than 100 ft. per minute. The motor control for starting shall be such as to prevent the starting torque from exceeding 1-1/2 G's. The motor and drive shall be reversible for hoisting up or down.

AC or DC current may be used; however, the motor, clutch and brake shall be of such a type as to be suitable for operation as a system, to meet the control requirements outlined in Section 4 of this specification.

(d) Clutch

A clutch shall be provided which will release the drum from the motor drive to allow free, frictionless operation of cable and drum. The clutch shall operate in conjunction with the hoist motor as described in the controls section of this spec. It shall also be possible for the operator to engage or disengage it manually, from the control station, for emergency breaking without energizing the hoist motor.

(e) Brake

A brake shall be provided to work in conjunction with the drum. It may be of the band, shoe or disc type and shall be capable of stopping a load of 13,000 pounds, traveling up or down at a rate of 20 ft. per second, within a distance of 15 feet. The operator shall have control of this brake; in addition, the brake shall function automatically as described in the controls section of this specification. The brake shall give smooth positive operation. Fail-save provisions shall be incorporated into the brake design which will permit continued brake operation in case of electrical power failure.

(f) Shock Absorber Cylinders

Shock absorber cylinders shall be provided in the system to absorb excessive shock loads resulting from sudden acceleration or deceleration. Two 18" stroke hydro-pneumatic cylinders shall be installed in the hangar roof structure to support the main hoist cable load. These cylinders are to be constructed per Convair Drawing 5-00502 and installed per Drawing 5-00507.

2. Counter-Balance System

A counter-balance system shall be installed in the hanger structure as shown on Convair Drawing 5-00510. The purpose of this system is to provide motive power for winding the drum to maintain cable tension at all times when the system is in free wheeling.

(a) Cart

A counter-balance weight cart shall be installed on a track along the side of the hangar, as shown on above drawing. This cart is interconnected with the hoist drum through a 5/8 dia. cable and with the bottom of the load through a double 1/2" dia. cable.

It shall be possible to balance the cable system by adding or removing weight at the cart to give the desired tension on the hoist cable above the load.

The cart assembly shall be in accordance with Convair Drawing 5-00509.

(b) Cart Snubber

A hydro pneumatic cylinder shall be installed on the counter-balance cart to act as a shock absorber for the counter-balance system and follow-up cable loads. This cylinder is to be constructed to specifications given on Convair Drawing 5-00502 and installed on the cart assembly per drawing 5-00509.

3. Side Control Cable

(a) A side control cable shall be installed as shown on Convair Drawing 5-00511. It shall be arranged in such a fashion as to prevent the load from rotating more than 180°. It shall also allow maximum freedom to permit moving the load to any position within a 60° cone with the load at mid position between the deck and the hoist platform.

(b) A tension tightener will be installed on the side control cable to maintain a slight tension in the cable at all times. A second pickup shall be provided which will give additional length for over travel of the load. This system is shown on Convair Drawing 5-00511.

4. Controls

Provisions shall be made for controlling the hoisting mechanism as follows:

(a) The hoist motor brake and drum brake shall release automatically and the clutch shall engage when the hoist motor is energized. The brakes also apply automatically and the clutch releases when the hoist motor is de-energized. It shall be possible to engage the clutch manually, for emergency braking, with the hoist motor de-energized.

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4. Controls (cont'd)

(b) After hoisting load to desired position by manual operation, the hoist motor is de-energized and the load is held by the brake. Upon release of the brake the system is in free wheeling. The brake is applied automatically, as required, to limit the cable speed to a maximum of 20 ft. per second in either direction unless overriden manually by the operator. It shall be possible for the operator to apply or release the brakes at any time, including a condition of power failure as described in control section.

(c) The brakes release automatically when the load is removed from the hoisting cable and the counterbalance weight takes over, reversing the load forces on the hoisting drum. For this condition the load is lifted by another source (other than the hoist motor) and the system is then in "free wheeling".

(d) With the hoist motor de-energized and the system in free wheeling, the brake is applied automatically when the load attach point for the hoisting cable is 137 ft. from the hangar deck, going up and 70 ft. from the hangar deck going down. It shall be possible for the operator to override the brake control at any time.

(e) Speed indication shall be provided to show cable travel in feet per second, both up and down.

(f) A limit switch shall be incorporated into the system to shut off the hoisting motor automatically when the load attach point for the hoisting cable is 168'-0" from the hangar deck going up and when it reaches the hangar deck going down.

(g) A control and indicator panel shall be provided by the subcontractor of the hoisting equipment. This panel shall be complete with brake control lever, emergency clutch control lever, speed indicator, load position indicator (feet from deck), light indication for brake "on" (red), brake "off" (green), clutch engaged (amber) and power "on"-"off".

The control panel shall be located remotely from the hoisting equipment at a point approximately 250 ft. away.

II. Alterations to Hangar

(1) Hoisting Platform

A platform shall be erected in the hangar roof structure at main arch No. 1 and on the hangar centerline, as shown on Convair Drawing No. 5-00501. This platform will attach to the main arch pin and to other hangar structure as required for stabilization. Attachment will be by means of bolts or clamps with a minimum amount of alteration to existing hangar structure.

The platform structure shall be capable of sustaining accelerated loads of 65,000 pounds plus approximately 15,000 pounds weight for hoisting equipment and platform structure. Aluminum alloy construction is required to keep the structural weight to a minimum.

Mounting provisions shall be incorporated into the platform structure for all hoisting equipment such as motor, gear drive, clutch, drum and brake.

Adequate bracing shall be provided to the platform for stabilizing the forces imposed by side loads up to 32,500 pounds, applied at the cable rollers on the bottom of the platform.

(2) Counter-Balance Car Track

A counter-balance car track shall be installed at Arch No. 1 along the side of the hangar from arch point 2-1/2 to within approximately 6 ft. of the hangar deck. This track is to be constructed and supported to the hangar structure in accordance with Convair Drawing 5-00510.

(3) Counter-Balance Cable Attachment

The counter-balance cable shall be supported and attached to the hangar structure through brackets and pulleys as shown on Convair Drawing 5-00510. The friction in the system shall be kept to a minimum by the use of frictionless bearings in all pulleys and rollers.

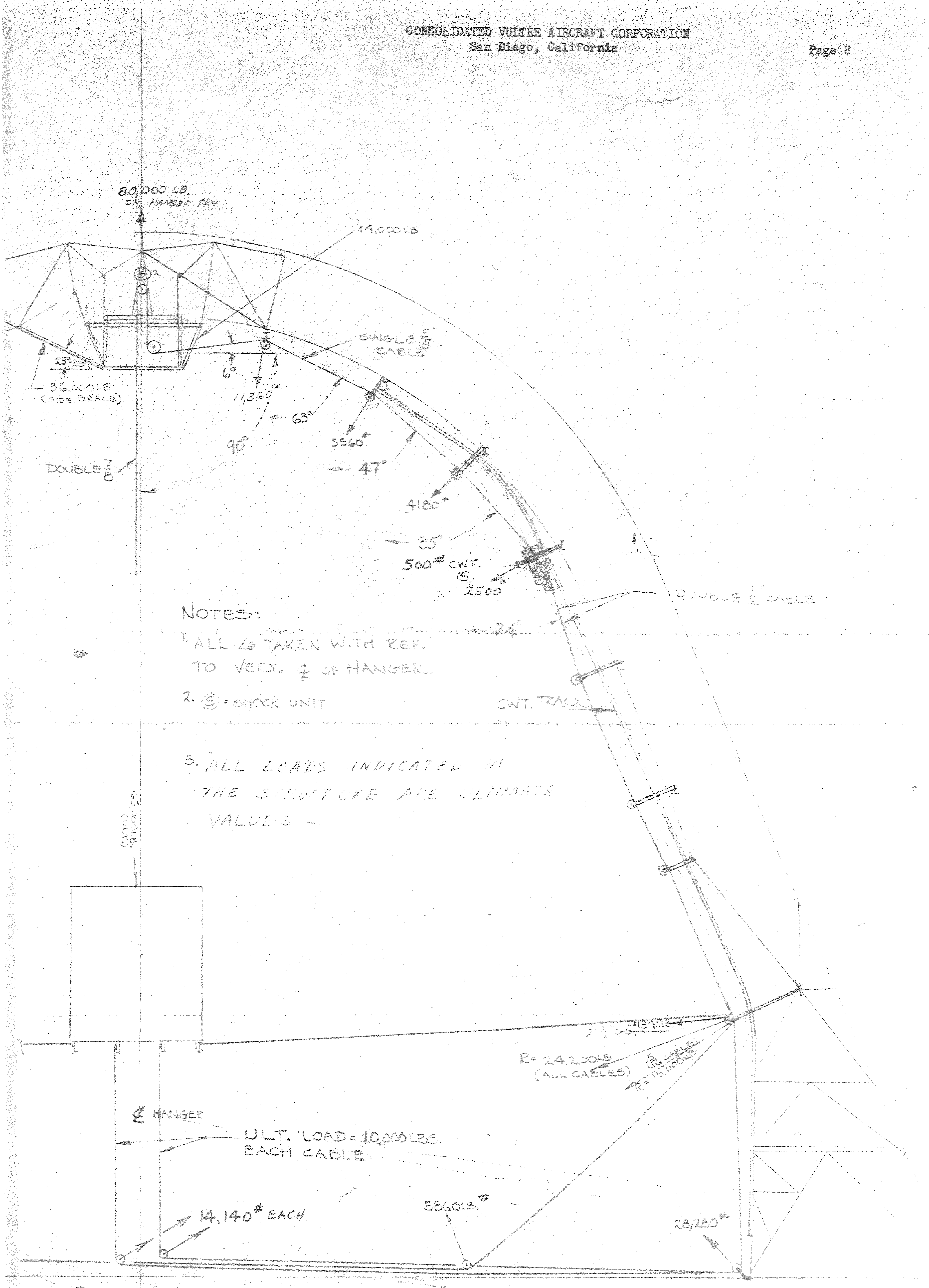
Two pulleys shall be anchored in the hangar deck on the hangar centerline and approximately 28 ft. apart as shown on 5-00510. These points shall be capable of withstanding a force of 14,140 lbs. each as noted on Fig. 2 of this report.

(4) Side Control Cable

The side control cable is attached to the hangar at the main arch - "A" frame pin and to pulleys anchored in the hangar deck. These points are on the ℄ of arch #1 at 62 ft. each side of the hangar centerline. It is also attached to a tension tightner which maintains and varies cable tension as required. This assembly consists of a track located along the hangar centerline which guides a roller assembly with tension supplied by elastic shock cord. This arrangement is shown on Convair Drawing 5-00511.

(5) Loads Imposed on Hangar

The loads imposed on the hangar structure, by installation and operation of the equipment described above, are shown on ZM-5-027, Fig. 1.



NOTES:

1. ALL ∠s TAKEN WITH REF. TO VERT. ℄ OF HANGER.

2. Ⓢ = SHOCK UNIT

3. ALL LOADS INDICATED IN THE STRUCTURE ARE ULTIMATE VALUES –

DIAGRAM – HANGAR LOADS – MOFFETT FIELD TEST RIG

ZM-5-027

PULLEY ~~LOAD~~ ARE BASED ON 20,000 LB TOTAL CABLE LOAD.

FIG. 2

MAX. PERMISSABLE LOAD IN 5/16 CABLE = 8,000 LB. (ULT.)

SCALE: 1/16 IN. = 1 FT.

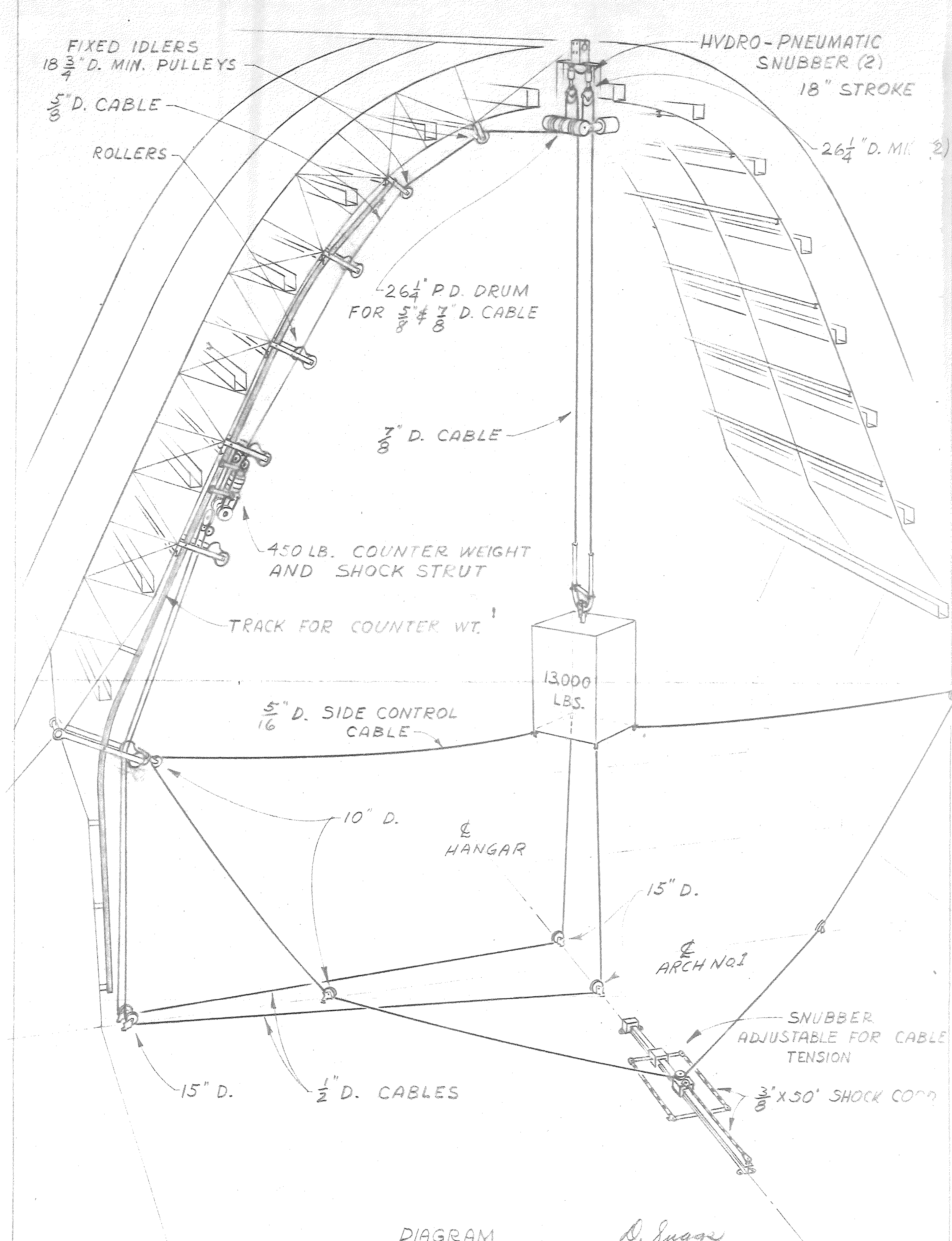
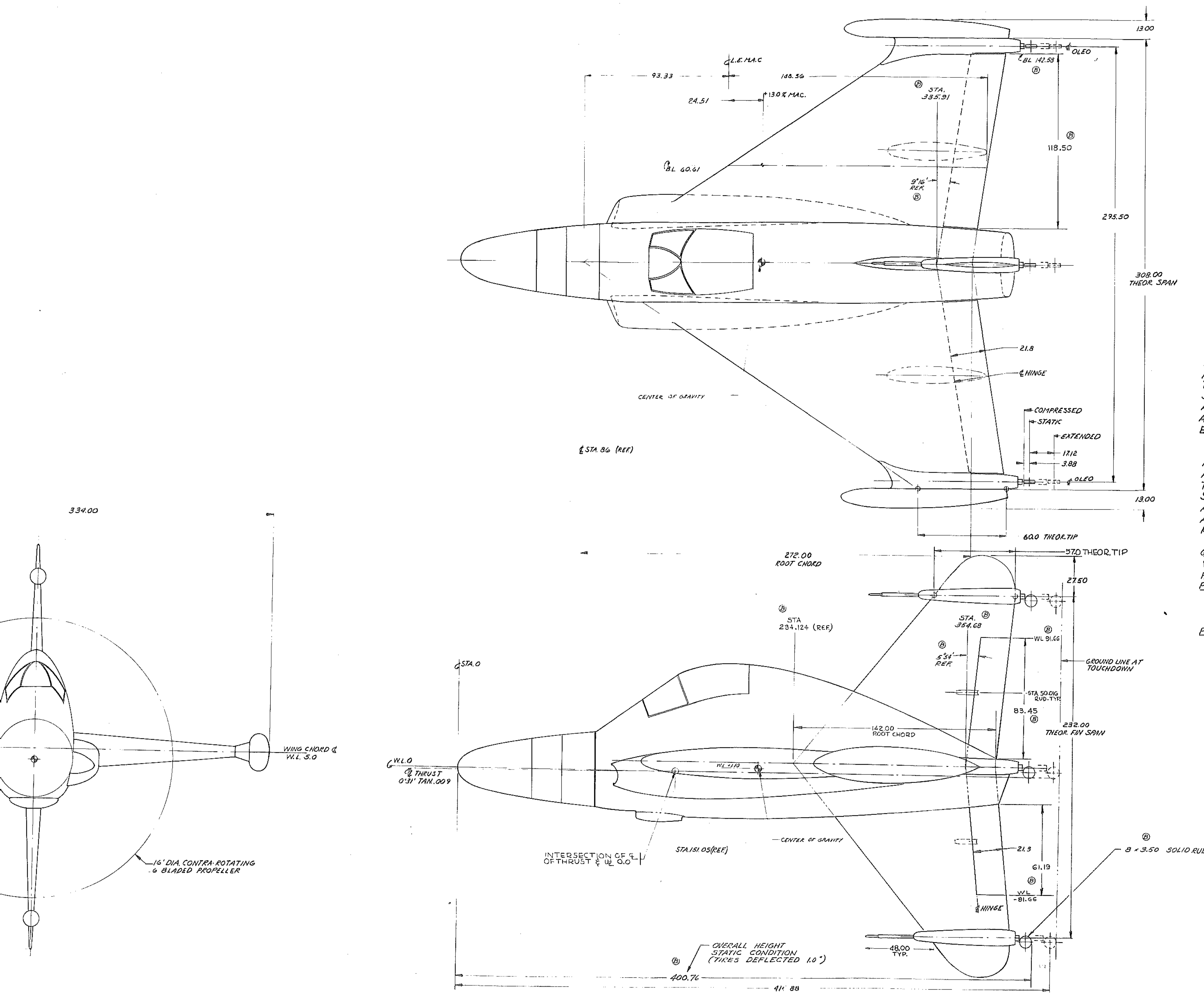


DIAGRAM
MOFFETT FIELD TEST RIG

D. Suggs
3/5/53

ZM-5-027
FIG. 1



WING	
AREA (TOTAL TO ℄)	355 SQ. FT.
ASPECT RATIO	1.85
TAPER RATIO	4.53
SWEEPBACK	L.E. 57° T.E. 9°16'
AIRFOIL-ROOT (9% THICK)	NACA 63-009 (MODIFIED)
AIRFOIL-TIP (7.8% THICK)	NACA 63-009 (MODIFIED)
ELEVON AREA (AFT OF HL)	36 SQ. FT. DEFL. ±41.75 (ELEV. ±30 AILERON ±20)
FINS	
AREA (TOTAL TO ℄)	176 SQ. FT.
ASPECT RATIO	3.03
TAPER RATIO	2.49
SWEEPBACK	L.E. 40° T.E. 5°54'
AIRFOIL-ROOT (9% THICK)	NACA 63-009 (MODIFIED)
AIRFOIL-TIP (7.1% THICK)	NACA 66-009 (MODIFIED)
RUDDER AREA (AFT OF HL)	20.4 SQ. FT. DEFL. ±30°
GROSS WEIGHT	14250 LBS.
WING LOADING	40.2 LBS/SQ. FT.
POWER LOADING (T.O.)	2.58 LBS/ESHP
POWER PLANT	
MFR & DESIGNATION	ALLISON T40-A-14
TYPE	TURBO-PROP.
RATING	5525 ESHP (T.O.)
PROPELLER	
MFG.	CURTISS-WRIGHT
TYPE	6 BLADE CONTRA-ROTATING
SIZE	16 FT. DIA.

CONFIDENTIAL
SECURITY INFORMATION

5-00001
AUTHORIZATION EWO 5511
B

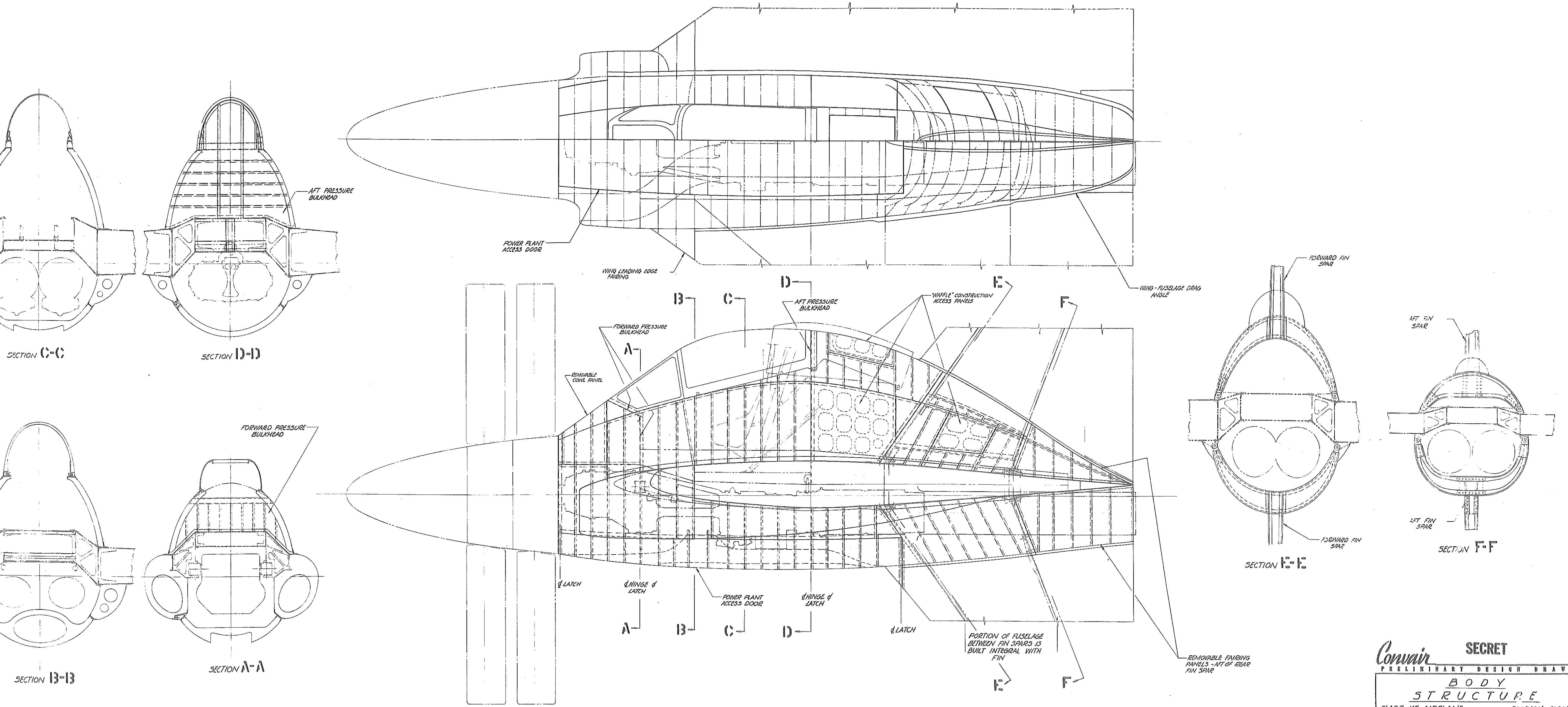
5-00004

TWENTIETH

GENERAL ARRANGEMENT-
CONVOY FIGHTER

5-00001

R-12-8-52



Convair **SECRET**

PRELIMINARY DESIGN DRAWING

BODY
STRUCTURE
CLASS VF AIRPLANE CONVOY FIGHTER

BY	CHECKED	APPROVED	SCALE 1/10	DATE

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
SAN DIEGO CALIFORNIA

SD-50-15005

Mdl 5

ANTICIPATED MAN-POWER ALLOSATION FOR MODEL 5 TETHERED FLIGHT TEST AT MOFFETT FIELD PILOTS FAMILIARIZATION PROGRAM

		ENGINEERING			EXPERIMENTAL		
CALENDAR	PERIOD	DESIGN	SHIPMENT	TEST	DESIGN	SHIPMENT	TEST
Actual thru 13 April		2527					
~~JAN~~	1953	2					
~~FEB~~		6					
~~MARCH~~	—	9					
APRIL		7 6 6			1		
MAY		5 6 5			1		
JUNE		3 6 4			1		
JULY		3 6 4			1		
AUG		3 6 4			1	Truck	
SEPT.		3 6 4			1		
OCT.		3 6 4			1		
NOV.		6 4			1		
DEC.			1/4	25		30	41
JAN	1954			25			41
FEB				25			41
MARCH			1/4	25		30	41
		98	1/2	1000	8	30 (truck)	164 3½ mo.
		9360 hrs.	99½	19500	1728	3000	21,996

Model 5

Anticipated Man-Power Allocations for Tethered Flight Program at Moffett Field :

Calendar Period	Men Per Month	
	Engineering	Experimental
April 1953	9	
May "	9	
June "	9	
July "	9	
August "	10	
Sept. "	10	
October "	15	
November "	15	—
December "	16	46
January 1954	16	47
February "	16	47
March "	16	46

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

14 April 1953

MOFFETT FIELD TRIP REPORT

A visit was made to Moffett Field April 8, 9 and 10 by Lt. W.C. Bergstedt of the Convair Navy BAR Office and D. B. Suggs of Convair Engineering Department. The purpose of this trip was to check the Model 5 test rig design drawings against the hangar structure to which the rig will be attached and to acquaint the Moffett Field personnel concerned with the progress to date.

Moffett Field personnel contacted were as follows:

Capt. B. B. Nichol - Commanding Officer at Moffett Field
Cmdr. E. G. Osborn - Executive Officer
Cmdr. H. C. Rowe - Public Works Officer
Cmdr. C. W. Swanson - Operations Officer
Mr. Morris M. Viele - Public Works Design Supt.

These were the same personnel contacted on the previous visit in November, except for Cmdr. Swanson who has replaced Cmdr. Frauenheim as Operations Officer in charge of the hangar. Much interest still prevails at Moffett concerning this installation and complete cooperation was shown by all.

The scale model of the hangar and test rig and the detail design drawings were shown to the above in Capt. Nichol's office and were discussed more thoroughly later with Mr. Viele, Public Works Design Superintendent. They were in full accord with the existing design and stated that they would give immediate approval to the Bureau of Yards and Docks as soon as our drawings are received by them for check.

The detail design was checked in the hangar and additional photographs were taken at structural attach points.

Air pressure (100 to 115 psi) is available in the hangar for operation of the hoist clutch and brake mechanism. Receivers will need to be installed to maintain a constant pressure at the rig.

Electrical power (2300 V - A.C. stepped down to 220 V - 3~A.C.) is available in the hangar for operation of the hoist motor. (D.C. power is not available.)

Adequate shop facilities are available in the hangar at the VC3, VX5 and maintenance shops. AN standard fittings, bolts, hose, etc., also sheet stock, tubing, bar stock, etc., may be checked out of the parts cribs. The Station Supply Officer (Cmdr. Wheeler) stated that these parts will be supplied upon receipt of a letter of authority from the BAR. Work benches, tables, parts cribs, etc., are available in the hangar. Special tools such as work stands, handling equipment, ladders, vices, etc., should be shipped. Office equipment such as desks, chairs, typewriter, drafting machine, metal file cabinet, paper, pencils, data pads, etc., should be shipped.

Adequate housing will be available on the base for Convair personnel during the test. New barracks, now under construction, will be complete in August. Private automobiles may be kept there on the base provided liability insurance is carried.

JP4 fuel is available at the base; however the EEL-3A oil will have to be shipped.

Photographers and necessary equipment will be furnished by Moffett Field as required.

Shipping of the airplane by water will be simplified by a new deep channel from San Francisco Bay to Moffett Field which is scheduled for completion late this fall.

It was agreed that a request would be made by the local BAR office for funds to cover Moffett Field for any expenses incurred by them in connection with this program.

D.B. Suggs
D. B. Suggs

cc: Capt. B. B. Nichol, Moffett Field (3)
Capt. C. W. Stirling, Navy Office
Lt. W. C. Bergstedt, Navy Office
R. L. Bayless
N. W. Bouley
C. B. Carroll
F. W. Davis
J. James (Estimating Dept.)
J. H. Famme
F. W. Fink
A. B. McFarland
L. Moore
J. O. Pike
E. D. Shannon
D. B. Suggs

JOB ESTIMATE WORK SHEET

ENGINEERING DEPARTMENT - INSTRUMENTATION GROUP

PROJECT: Model 5 Tethered Flight Test at Moffett Field

Ref: Amendment to NOa(a)51-936-C, dated 11 March 1953

WORK ITEMS:

	D.L.H.	$ MAT'L
1. Maintenance of airborne instrumentation and operation of ground data recording cameras for 3 month period.	3,000	1,000.
2. Purchase of photographic paper and film on contract		2,500.
3. Provisions should be made to facilitate (5) five Instrumentation technicians with housing and transportation. (450 MAN DAYS)		
REMARKS: It is assumed instrumentation installations will not exceed those as required for Plan No. II described in CP No. 52-62-1.		
TOTALS	3,000	$3,500.

✓ 1 Phototechnician
4 Tech.

COST PROPOSAL SER.# 50-156-3 DATE OF LAST C.P. REVISION: 11 March 1953

ESTIMATE TO: Dave Faulk PHONE: 1706

ESTIMATED BY: T. R. King DATE: 3-16-53 620/ph

Approved: R. B. Thompson

R B Thompson

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SECURITY INFORMATION

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

8200 M/hrs.

DATE 18 March 1953

TO L. Moore

SUBJECT Model 5 Tethered Flight Pilot's Familiarization Program

Reference (a) Cost Proposal Outline No. 50-156-3 dated 11 March 1953

The following estimate is based on 25 hours flight time and 3 months elapsed calendar time, as set forth in reference (a). Fuel and oil requirements should be based on 50 hours of engine running to allow for ground runs. This would require 21000 gals. of fuel and 500 gals. of oil.

GAS = 420/HR
OIL = 10/HR

Experimental Flight Section personnel requirements for the program will be as follows:

A. At San Diego prior to start of program 9195

1. One pilot	200 manhrs.
2. One flight engineer	200 manhrs.
3. One senior flight test engineer	700 manhrs.
4. Two flight test engineers	1400 manhrs.
	2500 ✓

B. At the test base (4 MO.) 200 HRS./MO.

1. One pilot	Full time = 800
2. One flight engineer	50% time = 400
3. One senior flight test engineer	Full time = 800
4. One flight test engineer	Full time = 800
5. One instrumentation engineer	Full time = 800
	3600 ✓

C. At San Diego during the program (3 MO.)

1. One flight test engineer	Full time = 600
2. One data analyst	Full time = 600
	1200 ✓

D. After completion of the program (SAN DIEGO)

1. Two flight test engineers	450 manhrs.
2. Two data analysts	450 manhrs.
	900 ✓

5 MEN × 30 da. × 4 MO = 600 MAN DAYS (PER DIEM)

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SECURITY INFORMATION

18 March 1953
Page 2

To: L. Moore
Subj: Model 5 Tethered Flight Pilot's Familiarization Program

In addition to the above, some stenographic personnel would be required at the test base, but it is anticipated that this department's requirements can be filled through a stenographic pool. Consideration should also be given to providing one calculating machine for the exclusive use of Experimental Flight personnel at the test base.

Per diem charges and automobile transportation costs at the test base should be included for one month prior to and throughout the entire program calendar time for all Experimental Flight personnel at the test base. Transportation costs should also include two round-trips between San Diego and the test base for each month that the program is in progress.

The above estimate does not include any contingencies.

Prepared by J H Mason
J. H. Mason
Sr. Flight Test Engineer

Approved by W J Martin
W. J. Martin
Chief Test Pilot

JHM:jp
cc: File (2)

CONVAIR

MAR 26 1953
P. E.

25 March 1953

MODEL 5

Walt:
Your reply is
required immediately
These new figures
(copies in
Flt. Program
folder)

Cost

1. Flight test
2. Captive test

Due to several factors, it was necessary that I make arbitrary cuts in some of the proposed M/H for the above items.

1. Flight test

		SR - 38	Short
		23 mo.	4 mo.
✓ Aero		4600	1600
Dynamics		4600 plus 800 - flutter 800 - α dev.	1600
✓ Thermo		1900	480
✓ Structures		400	200
✓ Weights		1550	400
	Total	14,650 M/H	4,280 M/H

2. Captive test

25 hours test
3 mo. program

Aero		900
Dynamics		900
Thermo		200
Structures		1200
Weights		200
	Total	3,400 M/H

It is important that you modify previous plans for these programs to stay within these hours. If it is not reasonable to do so, please advise today.

If you agree please send AVO to Planning and Scheduling confirming these hours.

R. L. Bayless

RLB:eb
cc: C. B. Carroll
J. E. Perkins ✓

L. Moore

CONVAIR

MAR 27 1953
PxE

March 26, 1953

Memo to: L. Moore

From: M. Dublin

Subject: Model XFY-1 Minimum Tethered Flight Test Program.

Reference: a) Memo from R.L. Bayless to C.B. Carroll & J.E. Perkins Regarding Model 5 Man Hour Reduction, dated 25 March 1953

1. In accordance with Reference a) the following Dynamics Man Hours are required for the subject program (i.e., 3 months program with virtually no instrumentation).

	Hours
a) Liaison with Flight & Technical Groups	900

2. It is requested that AWO'S and EWO'S be issued for the above work.

M Dublin
M. Dublin

cc. L. Moore
C.B. Carroll
E.D. Shannon/W.J. Martin
M. Dublin
Dyn. Files

NOTE & RETURN TO
INIT. DATE
Perkins 3/27

CONFIDENTIAL
SECURITY
INFORMATION

543A

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 17 March 1953

TO R.C. Hix

SUBJECT Model 5 Airplanes - Pilot's Familiarization Program - Moffett Field

REFERENCE (a) Cost Proposal Outline Serial #50-156-3 of 11 March 1953

Reference (a) has been reviewed and the cost estimate to accomplish that portion of the task assigned to the Engineering Test Laboratories is submitted herewith:

Item 7 - VII - A, B, & C.

It is assumed that all the dynamic test equipment will be engineered and installed with labor charged to the Flight Demonstration Program.
Time for check-out, system test, liaison, etc.......................... 200 hr

TASK DELETED

Item 7 - VII - D & E.

Monitor ground and flight operation throughout a three-month period. Provide suitable calibration for all data taken, edit data and provide limited data reduction service as required.
Two men - three months.. ~~1200 hr~~

PER DIEM.

Item 7 - VII - G.

Static Test of Facility at Moffett Field.
~~(a) Design fixture.. 40 hr~~
(b) Liaison and conduct test.. 100 hr

Total - Engineering Test Laboratory - ~~1540 hr~~ 100

NOTE: No time has been estimated for obtaining and analyzing data relative to dynamic testing which, experience indicates, may be required.

13. Major Purchased Items Required

The following items will be required for the static test of the facility:
(a) Steel - 10,000 lb at $0.08.. $800.00
(b) Valves and fittings... 40.00

Total - - - - - - - - - - - - - - - - - $840.00

14. Capital Facilities Required

It is assumed that the dynamics test instrumentation required will be available from the Flight Demonstration Program.

E.F. Strong
Chief of Test Laboratory

EFS:el
cc: R.C.Hix/E.F.Strong/M.C.Brady/
H.A.Welch/Test Files

CONFIDENTIAL
SECURITY
INFORMATION

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

MODEL 5(XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

NOTES:

1. ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953
2. ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.
3. IT IS REQUESTED THAT A DETAILED BREAKDOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.

NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.

TYPE OF BID: FIRM
TYPE CONTRACT ANTICIPATED: CPFF
WING SPAN:
FUSELAGE LENGTH:
MAXIMUM FUSELAGE HEIGHT:
MAXIMUM FUSELAGE WIDTH:
GROSS WEIGHT:
WEIGHT EMPTY:

CVAC FABRICATED WEIGHT (APPROXIMATE):
TACTICAL ______ STRIPPED ______ STATIC TEST ______

TYPE DRAWINGS: EXPERIMENTAL
COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:
TYPE HANDBOOKS:

TYPE MANUFACTURE: EXPERIMENTAL

Suggs' Group D.B. Suggs 3/12/53 Other Groups

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE	WING GROUP FORGING			
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☒ 5060	☐	☒ 195 (Power Plant)	☒ 140	(ACTUAL)	☐ EWO 4609	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☒ 390	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☒ 195	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☒ 195	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	LIAISON	☐	☒ 2535 ✓	☐	☒ 1170	☐	☐	☐	☐
	~~CHECKING~~	☐	☐ (2 men, 5 mo.	☐	☐ (2 men, 3 mo.)	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐ 1 man, 3 mo.)	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
	Total	☐	☒ 8375	☐	☐	☐	☐	☐	☐
	20% Contingency	☐	☒ 1675	☐	☐	☐ 32	☒ TECH.	☐	☐
	TOTAL MAN-HOURS	☐	☒ 10,050	☐	☒ 1,365 ✓	☐ 170	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐ + 1 man for [illegible]	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC., ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐

EXPERIMENTAL DEPARTMENT ESTIMATE

PROJECT
DESCRIPTION MODEL 5 (XFY-1 Tethered Flight Tests at Moffett Field --

SHIPMENT BY LAND ~~(11 mo. at Moffett Field)~~

COST P. O.
SERIAL NO. 50-156-3
DATED 1-15-53
EST. DATE 2-2-53

** REVISED 3-17-53

ITEM NO.	ITEM DESCRIPTION	TOOL DES. & PLANNING	TOOL MFG.	FAB. & ASSEMBLY	ENG'R'G. TESTS	W. T. MODELS	FLIGHT MAINT.	OTHER	TOTAL
9-IV	EXP. DEPT. TASK								
A	Modify #1 flight Article at San Diego, with such attachments as designed to fasten Airplane to hoist and controls to accomplish tethered or captive condition.								
	(1) Cable attachment at nose	40		500					540
	(2) Tethering line attachment	40		600					640
	(3) Install tethering and brake controls	10	20	150					180
	(4) Plane to ground communication			100					100
	(a) Telephone lines								
* B	Maintain service and repair plane at Moffett field								
	(1) Parts fabrication at Convair S.D.	300	1500	12000		(4 mo.) (7 mo.)	22900 40075		36700 53875
* C	Supply spare parts, fittings, tools, and equipment to maintain a "shop" at Moffett field								
	(1) Parts Crib , work benches pneumatic guns, hose, drill motors, drill press grinder, band saw, locks	Nowry -- (Exp. to furnish list of Equip. Required)							
D	Maintain, service, and repair tethering equipment during test program			500					500
E	Delivery and Shipping Instructions								
	(1) Disassemble ship #1 at Convair, S.D.			2280					2280
	(2) Crate			3000					3000
	(3) Reassemble plane for tests			5725					5725
	(4) After tests are completed, disassemble plane at Moffett			2280					2280
	(5) Crate " "			1500					1500
	(6) Reassemble at Convair			5725					5725
~~F~~	~~Pilots' escape provisions~~								
	~~(1) Install hooks on the windshield structure above the pilots' seat~~			~~250~~					** ~~250~~
~~G~~	~~Landing load test platform (Assist to E.T.L.)~~	Cancelled							
~~H~~	~~Assist to Instrumentation~~			~~500~~					** ~~500~~
I	Hoist Support Structure 1000 # Al.Alloy Struct.			8500					8500
J	Proof Loading Test Rig			1500	1145				2645
	TOTAL D.L. HOURS	390	1520	~~45110~~ ** 44360	1145	(4 mo.)	22900		~~71065~~ ** 70316
	LABOR COST @ PER HOUR					(7 mo.)	40075		~~88240~~ 87540
	MATERIAL COST								
	TOTAL LABOR & MATERIAL COST								

DATA & CONDITIONS

(1) *B. Includes only minor repairs to structure or Control Surfaces -- major components subject to future negotiation.

(2) *C. Does not include Convair Fabricated Parts.

(3) No. Men at Moffett 25 for Per Diem & Travel Expense

(4) This estimate based on a 53 - hour week

** ITEM F - PILOTS ESCAPE PROV. AND H - ASSIST TO INSTRUM'TN ARE CANCELLED

SUPERCEEDED

APPROVED:-
Experimental Superintendent

Engineering Plan. & Est.

E X P E R I M E N T A L   D E P A R T M E N T   E S T I M A T E

PROJECT DESCRIPTION MODEL 5 (XFY-1 Tethered Flight Tests at Moffett Field --

SHIPMENT BY BOAT

COST P. O.
SERIAL NO. 50-156-3
DATED 1-15-53
EST. DATE 2-2-53

** REVISED 3-17-53

NO.	ITEM DESCRIPTION	TOOL DES. & PLANNING	TOOL MFG.	FAB. & ASSEMBLY	ENG'R'G. TESTS	W. T. MODELS	FLIGHT MAINT.	OTHER	TOTAL
9-IV	EXP. DEPT. TASK								
A	Modify #1 flight Article at San Diego, with such attachments as designed to fasten Airplane to hoist and controls to accomplish tethered or captive condition.								
	(1) Cable attachment at nose	40		500					540
	(2) Tethering line attachment	40		600					640
	(3) Install tethering and brake controls	10	20	150					180
	(4) Plane to ground communcation (a) Telephone lines			100					100
* B	Maintain service and repair plane at Moffett field	300	1500	12000			(4 mo.)	22900	36700
	(1) Parts fabrication Convair S.D.						(7 mo.)	40075	53875
* C	Supply spare parts, fittings tools, and equipment to maintain a "shop" at Moffett field								
	(1) Parts Crib, work benches pneumatic guns, hose, drill motors, drill press grinder, band saw, locks	Nowry -- (Exp. to furnish list of Equip. Required)							
D	Maintain, service and repair tethering equipment during test program			500					500
E	Delivery and Shipping Instructions								
	(1) Disassemble ship #1 at Convair, S.D.			1060	(Includes 1 coat liquid envelope)				1060
	(2) Crate			1500	(Props -- Service equipment)				1500
	(3) Reassemble plane for tests			2700					2700
	(4) After tests are completed, disassemble plane			1060					1060
	(5) Crate			1500					1500
	(6) Reassemble at Convair			2700					2700
~~F~~	~~Pilots' escape provisions~~								
	~~(1) Install hooks on the windshield structure above the pilots' seat~~			~~250~~					** ~~250~~
G	Landing load test platform (Assist to E.T.L.)	Cancelled							
~~H~~	~~Assist to Instrumentation~~			~~500~~					** ~~500~~
I	Hoist Support Structure 1000 # Al.Alloy Struct.			8500					8500
J	Proof Loading Test Rig			1500	1145				2645
	TOTAL D.L. HOURS	390	1520	** 34370 ~~35120~~	1145		(4mo.)	22900	** ~~61075~~ 60325
	LABOR COST @ PER HOUR						(7mo.)	40075	~~78250~~ 77,500
	MATERIAL COST								
	TOTAL LABOR & MATERIAL COST								

DATA & CONDITIONS
(1) *B. Includes only minor repairs to structure or Control Surfaces -- major components subject to future negotiation.
(2) *C. Does not include Convair fabricated parts
(3) No. Men at Moffett 25 for Per Diem & Travel Expense
(4) This estimate based on a 53 - hour week

** ITEMS F- "PILOTS ESCAPE PROVISIONS" AND H-"ASSIST TO INSTRUMENTATION" CANCELLED & HOIST SUPPORT STRUCTURE

SUPERCEEDED

250
500
8500
9250

61075
9250
51825

APPROVED:- AB McFarland
Experimental Superintendent

Engineering Plan. & Est.

E X P E R I M E N T A L   D E P A R T M E N T   E S T I M A T E

PROJECT DESCRIPTION MODEL 5 (XFY-1 Tethered Flight Tests at Moffett Field --

SHIPMENT BY LAND ~~(11 mo. at Moffett Field)~~

COST P. O.
SERIAL NO. 50-156-3
DATED 1-15-53
EST. DATE 2-2-53

ITEM NO.	DESCRIPTION	TOOL DES. & PLANNING	TOOL MFG.	FAB. & ASSEMBLY	ENG'R'G. TESTS	W. T. MODELS	FLIGHT MAINT.	OTHER	TOTAL
9-IV	EXP. DEPT. TASK								
A	Modify #1 flight Article at San Diego, with such attachments as designed to fasten Airplane to hoist and controls to accomplish tethered or captive condition.								
	(1) Cable attachment at nose	40		500					540
	(2) Tethering line attachment	40		600					640
	(3) Install tethering and brake controls	10	20	150					180
	(4) Plane to ground communication (a) Telephone lines			100					100
* B	Maintain service and repair plane at Moffett field								
	(1) Parts fabrication at Convair S.D.	300	1500	12000		(4 mo.) (7 mo.)	22900 40075		36700 53875
* C	Supply spare parts, fittings, tools, and equipment to maintain a "shop" at Moffett field								
	(1) Parts Crib , work benches pneumatic guns, hose, drill motors, drill press grinder, band saw, locks	Nowry -- (Exp. to furnish list of Equip. Required)							
D	Maintain, service, and repair tethering equipment during test program			500					500
E	Delivery and Shipping Instructions								
	(1) Disassemble ship #1 at Convair, S.D.			2280					2280
	(2) Crate			3000					3000
	(3) Reassemble plane for tests			5725					5725
	(4) After tests are completed, disassemble plane at Moffett			2280					2280
	(5) Crate " "			1500					1500
	(6) Reassemble at Convair			5725 20510					5725
F	Pilots' escape provisions (1) Install hooks on the windshield structure above the pilots' seat			250					250
G	Landing load test platform (Assist to E.T.L.)	Cancelled							
H	Assist to Instrumentation			500					500
I	Hoist Support Structure 1000 # Al.Alloy Struct.			8500					8500
J	Proof Loading Test Rig			1500	1145				2645
	TOTAL D.L. HOURS	390	1520	45110	1145	(4 mo.)	22900		71065
	LABOR COST @ PER HOUR					(7 mo.)	40075		88240
	MATERIAL COST								
	TOTAL LABOR & MATERIAL COST								

DATA & CONDITIONS

) *B. Includes only minor repairs to structure or Control Surfaces -- major components subject to future negotiation.

(2) *C. Does not include Convair Fabricated Parts.

(3) No. Men at Moffett 25 for Per Diem & Travel Expense

(4) This estimate based on a 53 - hour week

SUPERCEEDED

APPROVED:-

Experimental Superintendent

Engineering Plan. & Est.

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. *50-156-3*

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD

PILOTS FAMILIARIZATION PROGRAM

NOTES:

1. *ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953*
2. *ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.*
3. *IT IS REQUESTED THAT A DETAILED BREAK DOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.*

NUMBER AND TYPE ARTICLES: *TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.*

TYPE OF BID: *FIRM*

TYPE CONTRACT ANTICIPATED: *CPFF*

WING SPAN:

FUSELAGE LENGTH:

MAXIMUM FUSELAGE HEIGHT:

MAXIMUM FUSELAGE WIDTH:

GROSS WEIGHT:

WEIGHT EMPTY:

CVAC FABRICATED WEIGHT (APPROXIMATE):

TACTICAL ______ STRIPPED ______ STATIC TEST ______

TYPE DRAWINGS: *EXPERIMENTAL*

COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:

TYPE HANDBOOKS:

TYPE MANUFACTURE: *EXPERIMENTAL*

	ACTIVITY ☒ = ESTIMATE REQUESTED	*SHIPMENT OF PLANE*	*DESIGN AND FACILITIES*	*FLIGHT TEST*	*LIAISON & MAINTENANCE*				
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC., ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

TOTAL MAN-POWER: REQUIRED BY MONTH																									APPROVED:
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

NOTES:

1. ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953
2. ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.
3. IT IS REQUESTED THAT A DETAILED BREAKDOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.

No lift Required [illegible]

NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.

TYPE OF BID: FIRM
TYPE CONTRACT ANTICIPATED: CPFF
WING SPAN: ____
FUSELAGE LENGTH: ____
MAXIMUM FUSELAGE HEIGHT: ____
MAXIMUM FUSELAGE WIDTH: ____
GROSS WEIGHT: ____
WEIGHT EMPTY: ____

CVAC FABRICATED WEIGHT (APPROXIMATE): ____
TACTICAL ____ STRIPPED ____ STATIC TEST ____

TYPE DRAWINGS: EXPERIMENTAL
COMPLIACE WITH MIL-D-5480A AND MIL-D-5481: ____
TYPE HANDBOOKS: ____

TYPE MANUFACTURE: EXPERIMENTAL

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE				
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC., ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
	No lift	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

TOTAL MAN-POWER: REQUIRED BY MONTH																									APPROVED:
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

NOTES:

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3. IT IS REQUESTED THAT A DETAILED BREAKDOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.

NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.

TYPE OF BID: FIRM

TYPE CONTRACT ANTICIPATED: CPFF

WING SPAN:

FUSELAGE LENGTH:

MAXIMUM FUSELAGE HEIGHT:

MAXIMUM FUSELAGE WIDTH:

GROSS WEIGHT:

WEIGHT EMPTY:

CVAC FABRICATED WEIGHT (APPROXIMATE):

TACTICAL ______ STRIPPED ______ STATIC TEST ______

TYPE DRAWINGS: EXPERIMENTAL

COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:

TYPE HANDBOOKS:

TYPE MANUFACTURE: EXPERIMENTAL

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE				
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC., ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
	Aircraft	☐ (This man is part of Project office staff)	☐	☐	☐	☐	☐	☐	☐
	Service	☐ One man during entire program 3 MONTHS	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	Per [illegible]	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐ None	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

TOTAL MAN-POWER: REQUIRED BY MONTH																									APPROVED:
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

CONFIDENTIAL

MAR 13 1953

P&E

CONSOLIDATED VULTEE AIRCR/ CORPORATION
SAN DIEGO DIVISION . . SAN DIEGO, CALIFORNIA

AVOID VERBAL ORDERS

TO L. Moore (Planning & Est.) DEPT. 6 DATE March 12, 1953

References: (a) Cost Proposal Outline Ser. #52-62-1 of 9 March 1953
(b) " " " Ser. #50-156-3 of 11 March 1953.

1. The aerodynamic man-hours required to conduct the tasks described in reference (a) are as follows:

Plan #1 - 6300 manhours
Plan #2 - 3600 manhours.

SUPERCEDED
SEE BAYLESS MEMO

2. The number of aerodynamic manhours required to conduct the modified captive flight program of reference (b) is estimated to be 1925 of which 525 manhours would be required at the test site. The time at the test site would not be continuous. It is estimated that approximately 10 man-round trips would be required.

900

cc: Carroll
Shick
Boteler

R. H. Shick

Chief of Aerodynamics

SIGNED:	DEPT. & FUNCT.	ROOM	COL/STA	BLDG.	PLANT	PHONE
R. H. Shick Ralph Shick	6 Aero		H106	51	1	1687

FORM-1008-C (SHOW YOUR COMPLETE ADDRESS & PHONE)

MAR 17 1953

CONVAIR

16 March 1953

Memo to: L. Moore

From : M. Dublin

Subject: Model 5 Airplane - Pilots' Familiarization Program - Moffett Field

Reference: a) Cost Proposal Outline, Model 5 (XFY-1) Tethered Flight Tests at Moffett Field, Pilots' Familiarization Program, Serial No. 50-156-3 dated March 11, 1953.

The following Dynamics man hours are required to complete the tasks stated in Reference a).

	Man hours	
a). Liaison with Experimental Flight Test Group on dynamics of the airplane	1,200	600 S.D. 600 MOFFET

1 MAN AT MOFFETT FULLTIME = 90 DAYS.

SUPERCEEDED SEE MEMO FROM BAYLESS 25 MARCH

900

M. Dublin

cc: L. Moore
C. B. Carroll
M. Dublin
L. G. Barbee
Dyn. Files

NOTE & RETURN TO

MODEL XFY 1 MODEL 5 TETHERED FLIGHT TEST (MOFFETT FIELD) PROPOSAL SERIAL No. 50-156-3
DATE ________ PAGE No. ________

PILOTS FAMILIARIZATION PROGRAM

NOTE: ALL DESIGN FUNCTIONS ARE COMBINED IN ONE SPECIAL DESIGN GROUP - WORK TO BE ACCOMPLISHED UNDER AWO # 9195 AND EWO #1410.

		SHIPMENT	DESIGN INSTALL.	TEST	MAN-DAYS (PER DIEM)
~~PRELIMINARY~~ DESIGN			10220		
~~WING~~ [illegible]				+ 600	+ 90
TAIL					
HULL, FLOATS, FUSELAGE					
ARMAMENT					
LAND'G GEAR & MECHANISMS					
FURNISHINGS					
CONTROLS					
POWER PLANT					
HYDRAULICS, PNEUMATICS					
HEATING, VENTILATING, PRESS.					
ELECTRICAL					
INSTRUMENTS					
ELECTRONICS					
SUB-TOTAL MAN HOURS			10220		
STRUCTURES-STRESS		100	1050	400	30
~~WEIGHTS~~					
~~CHECKING~~					
~~LINES~~					
~~LOFTING~~					
~~ISOMETRICS~~					
AERODYNAMICS				1925	75
DYNAMICS				1200	90
~~HYDRODYNAMICS~~					
[THERMODYNAMICS				390	5
PROPULSION LAB (RAMP)]					
~~ELECTRONICS LAB~~					
✓ ENG. TEST LAB				1540	180
INSTRUMENTATION				3000	450
~~SPEC. & SERVICE PUB.~~					
AIRCRAFT SERVICE				~~600~~	~~90~~
~~OPERATIONAL ANALYSIS~~					
✓ LIAISON				1365	180
SUB-TOTAL MAN HOURS		100	1050	10420	1100
TOTAL ENG. MAN-HOURS		100	11270	10420	1100
ENG. MAT. & DIR. CHARGES (INCLUDED)		25	2705	5750	
EXP. FACTORY MAN HOURS		10520	3995	35400	3000
~~EXP. FACTORY MATERIAL~~		–	–	–	
EXP. TOOLING MAN HOURS			110	1800	
~~EXP. TOOLING MATERIAL~~		–	–	–	
INSTRUMENT. MATLS. ~~W/T HOURS OF OPERATION~~				3500	
ETL. MATL. ~~W/T MAN HOURS (DEPT. 61)~~				840	
FLIGHT TEST FLYING HOURS	@16.00/HR			25	
* DATA ANALYSIS & COORD.				8200.	600
FUEL (GALLONS/HR.)	@ .22/GAL.			420	
OIL (GALLONS/HR.)	@12.00/GAL.			10	
1					4700 42300

REV.

* INCLUDES PILOTS TIME

PREPARED BY—
ENG. PLANNING & ESTIMATING

359T-14L5 KEUFFEL & ESSER CO.

~~STRUCTURES~~ GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

NOTES:

1. ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953
2. ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.
3. IT IS REQUESTED THAT A DETAILED BREAKDOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.

NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.
TYPE OF BID: FIRM
TYPE CONTRACT ANTICIPATED: CPFF
WING SPAN:
FUSELAGE LENGTH:
MAXIMUM FUSELAGE HEIGHT:
MAXIMUM FUSELAGE WIDTH:
GROSS WEIGHT:
WEIGHT EMPTY:
CVAC FABRICATED WEIGHT (APPROXIMATE):
TACTICAL ______ STRIPPED ______ STATIC TEST ______
TYPE DRAWINGS: EXPERIMENTAL
COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:
TYPE HANDBOOKS:
TYPE MANUFACTURE: EXPERIMENTAL

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE	LOAD TEST	SECURITY PROV.		
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC., ETC.)	☒ 100	☒ 750	☐	☒ 200	☒ 200	☒ 100	☐	☐
	LIAISON AT MOFFETT	☐	☐	☐	☒ 200	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐ 100	☐ 750	☐	☐ 400	☐ 200	☐ 100	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

Note! THIS ESTIMATE DOES NOT INCLUDE STRESS ANALYSIS OF MOFFETT FIELD HANGAR

3/17/53
BOE.

SUPERCEEDED
SEE MEMO FROM BAYLESS 25 MARCH

1200

TOTAL MAN-POWER: REQUIRED BY MONTH																									APPROVED:
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

NOTES:

1. ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953

2. ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.

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NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.

TYPE OF BID: FIRM
TYPE CONTRACT ANTICIPATED: CPFF
WING SPAN:
FUSELAGE LENGTH:
MAXIMUM FUSELAGE HEIGHT:
MAXIMUM FUSELAGE WIDTH:
GROSS WEIGHT:
WEIGHT EMPTY:

CVAC FABRICATED WEIGHT (APPROXIMATE):
TACTICAL ____ STRIPPED ____ STATIC TEST ____

TYPE DRAWINGS: EXPERIMENTAL
COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:
TYPE HANDBOOKS:

TYPE MANUFACTURE: EXPERIMENTAL

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE				
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐ 390	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC, ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐ 390	☐	☐	☐	☐
SERVICE PUBLICATIONS	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

1 Man at Moffett field for 5 days

SUPERCEED BY BAYLESS MEMO 25 MARCH.

200

TOTAL MAN-POWER: REQUIRED BY MONTH	3/4	3/4	3/4																						APPROVED:
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 6 April 1953

TO L. Moore, Engineering Planning and Estimating

SUBJECT Memo dated 2 April 1953, subject: "The Establishment of a Flight Test Program for the XFY-1 That Will Meet the Existing Budget".

Enclosure: (A) Copy of subject memo

It is requested that cost proposal outline for the Moffett Field program Serial #50-156-3 and Plan 2 of cost proposal outline Serial #52-62-1 be revised to agree with the subject memo.

C B Carroll

C. B. Carroll
Project Engineer

Make 5 P/C file

CONVAIR

Date: 2 April 1953

Memo to: F. W. Fink
N. W. Bouley
J. H. Famme

Subject: The Establishment of a Flight Test Program for the XFY-1 That Will Meet the Existing Budget.

Enclosure: (A) Recommended Moffett Field Restrained Flight Test Program.
(B) Recommended Flight Test Program (Qualitative).

1. The customer has requested that a cost proposal be submitted covering the demonstration of the XFY-1 in accordance with Specification SR-38E-1 Addendum XFY-1 dated 4 May 1951 in lieu of the $920,000 program spelled out in the existing contract. Indications are that this new flight test proposal will exceed two and one-quarter million dollars.

2. During the recent visit of Commander Sherby, Head of the Fighter Section, BuAer, this cost proposal as well as a cost proposal for the Moffett Field test program was discussed. Commander Sherby indicated that since these figures greatly exceeded the monies allocated for the VTO flight program, he would entertain a proposal for a greatly modified program. As a result of his comments, a revised cost proposal outline Serial #52-62-1 was issued. This revised proposal contained an abbreviated flight program as well as a flight program in compliance with SR-38E. Indications are that the abbreviated plan will exceed one million dollars.

3. The cost proposal for the Moffett Field program, Serial #50-156-3, will exceed three-quarters of a million dollars.

4. Our present contract with the Navy calls for 920,000 dollars to conduct the flight test program. It is believed that both the Moffett Field and flight test programs can be reduced in scope such that they can be accomplished for less than 920,000 dollars without materially detracting from the results. Enclosures (A) and (B) are the recommended programs.

C. B. Carroll

CONVAIR

6 April 1953

L. Moore, Engineering Planning and Estimating

Memo dated 2 April 1953, subject: "The Establishment of a Flight Test Program for the XFY-1 That Will Meet the Existing Budget".

Enclosure: (A) Copy of subject memo

It is requested that cost proposal outline for the Moffett Field program Serial #50-156-3 and Plan 2 of cost proposal outline Serial #52-62-1 be revised to agree with the subject memo.

C. B. Carroll
Project Engineer

CONVAIR

2 April 1953

RECOMMENDED MOFFETT FIELD RESTRAINED FLIGHT TEST PROGRAM

The following program is outlined to give the necessary requirements for conducting a pilot's familiarization program at Moffett Field.

I. A crew of men will be selected for the Moffett Field task, several weeks prior to shipment of the airplane. These men will be given the responsibility of servicing and maintaining the airplane during the initial checkout and engine run so as to be thoroughly familiar with the airplane when it arrives at Moffett Field.

The above crew will also aid in preparing the airplane for shipment (via Navy facility). The engine will be preserved in accordance with recommended procedures. The propeller will be pulled and crated for shipment along with the airplane. The airplane will be mounted on the standard ground handling cart for loading on the boat. It will then be removed from the ground handling cart, will be tied securely to the deck and covered with sufficient tarpolians to prevent damage while in transit.

The Moffett Field crew will go to Moffett Field immediately after shipment of the airplane to make the necessary preparations and assist in the unloading.

II. The three months test program will be conducted with the following:

(1) Design and supervision (45 hr. wk.)

1 Engineer in charge	(5 mo.)
1 Engineering Assistant (days)	(5 mo.)
1 Engineering Assistant (nights)	(5 mo.)
1 Service representative	(3 mo.)
2 Liaison men as required from other groups	(3 mo.)

6 = 4680 hours

(2) Flight Test (45 hr. wk.)(3 mo.)

2 Pilots, 1/2 time
1 Flight Engineer, 1/2 time
1 Senior Flight Test Engineer, 1/2 time
1 Flight Test Engineer
1 Data Analyst at San Diego (4-1/2 mo.)

4 = 2632 hours

II. (Cont'd)

(3) Experimental Shop - 8 men, 4-1/2 mo. (50 hr. wk.)
9 men, 4 mo.

1 Shop Foreman	(days)
1 Assistant Shop Foreman	(nights)
2 Rig Operators	(1 days, 1 nights)
6 Assembly & Maint. Mech.	(4 days, 2 nights)
4 Power Plant Mech.	(2 days, 2 nights)
3 Electricians	(2 days, 1 nights)

17 = 16,592 hours

(4) Other Departments - 4 mo. (50 hr. wk.)

2 Instrumentation men	(1 days, 1 nights)
2 Inspectors	(1 days, 1 nights)
1 Clerk	(Split shift)

5 = 4,340 hours

III. Organization Chart

ENGINEER IN CHARGE

ENGINEERING ASSISTANT (Days)

ENGINEERING ASSISTANT (Nights)

CLERK

SHOP FOREMEN (Days)	ASSISTANT SHOP FOREMAN (Nights)	FLIGHT TEST SUPERVISOR	DESIGN GROUP REPS. (As Required) Avg. 2 men, 3 mo.	MISCELLANEOUS DEPT. REPS.
1 RIG OPERATOR	1 RIG OPERATOR	2 PILOTS (50% time)	ELECTRICAL CONTROLS	1 SERVICE ENGR. REP.
4 ASSEM. & MAINT. MECH.	2 ASSEM. & MAINT. MECH.	1 FLT. ENGR. (50% time)	POWER PLANT	2 INSPECTORS
2 POWER PLANT MECHANICS	2 POWER PLANT MECHANICS	1 SR.FLT.TEST ENGR. (50% time)	STRESS DYNAMICS	2 INSTRUMENTATION
2 ELECTRICIANS	1 ELECTRICIAN	1 FLT.TEST ENGR.	AERODYNAMICS	1 TEST LAB

Avg. 33 men full time

IV. Elapsed Time Schedule

It is estimated that the following elapsed time will be required to design, fabricate, erect, test and complete the Moffett Field test components.

(1) Basic design and specifications for submittal to vendors

4-1/2 months (Jan. 1, 1953 to May 15, 1953)(Eng. at San Diego)

(2) Vendor followup and coordination

4-1/2 months (May 1, 1953 to Sept. 15, 1953)(Eng.at San Diego)

(3) Vendor fabrication and erection

4-1/2 months (June 1, 1953 to Oct. 15, 1953)

(4) Engineer in charge and assistants

5 months at Moffett (Sept. 15, 1953 to Feb. 15, 1954)

The engineer in charge and two assistants are to go to Moffett six weeks prior to start of test to supervise erection of test rig and check out equipment. (Proof load rig and measure hanger deflections to be done by Contractor during this time with assistance of Test Lab and Structures Group representatives.) A portion of the shop personnel should arrive in sufficient time to assist in this test. (1 foreman, 1 assistant foreman, 2 rig operators, 1 instrumentation man, 3 mechanics - 2 weeks before arrival of airplane.) The entire crew should be present when the airplane arrives to assist in unloading and preparation of airplane for start of tests which is estimated to be approximately November 1.

The 25 hours of flight testing is to be conducted during an elapsed time of 3 months (November 1, 1953 to February 1, 195~~3~~4). Approximately two weeks will be required after completion of test to remove test equipment and return to Convair. Return of airplane to Convair will be via Navy transportation, same as for shipment to Moffett.

V. Estimated Man Hours Required

A. Engineering

(1) Design, draft. and tech. data (San Diego)

Design	5840 hrs.
Flight test	900
Stress (includes 100 hrs. for loading check)	800
Test Lab	140
Dynamics & Aerodynamics	200

(2) Engineering at Moffett Field

Liaison and Serv. Engr.	3705 hrs.
Dynamics, Aero., Weights & Stress	1000
Flight Test	2632

B. Shop

(1) Parts Fabrication (San Diego)

Machine parts fab. & assem.	650 hrs.
Installation	100

(2) Preparation and Shipment (San Diego)

Experimental Shop labor based on Navy loading and transportation 10 men, 2 shifts, 50 hours	1000 hrs.

(3) Experimental Shop Maintenance at Moffett

17 men, 4-1/2 mo., 50 hr. wk.	16,592 hrs.

(4) Instrumentation, Inspection and Clerk

5 men, 4-1/2 mo., 50 hr.	4340 hrs.

C. Additional Costs

(1) Flight test ground hours	25
Flight test flying hours	25
	50 hrs. at $16.00 = $800.00

V. (Cont'd)

C. Additional Costs (cont'd)

(2) Fuel and oil to be furnished by Moffett Field

(3) Per diem allowance 4375 man days at $9.00

(4) Subcontract cost of rig, fabrication, erection, proof test and removal is estimated to run approximately $65,000.00.

D. Total Costs for Entire Program

Engineering	15,017 hrs.
Experimental Shop	22,682 hrs.
50 Flight hours at $16.00	$800.00
Per diem allowance 4375 days	$39,375.00
Subcontract for rig	$65,000.00

Note above costs do not include expense for the following items:

1. Spare parts, approximately $25,000.00.
2. Transportation at Moffett Field, approximately $2,500.00.
3. Operation of aircraft by service personnel.
4. Costs for capital facilities and shipment to and from Moffett, approximately $3,500.00
5. Fuel and oil for operating aircraft (to be obtained at Moffett Field at cost of Navy).
6. A Navy airplane should be made available for transportation between Moffett Field and San Diego during the tests, to be maintained and serviced by same crew which maintains Model 5 test airplane.
7. Premium pay for overtime.
8. 5% for engineering materials and direct charges.
9. Photography to be furnished by Moffett Field.
10. Electric power and maintenance shop equipment to be furnished by Moffett Field.
11. Fire fighting equipment and security guards shall be provided by Moffett Field.

2 April 1953

RECOMMENDED FLIGHT TEST PROGRAM (QUALITATIVE)

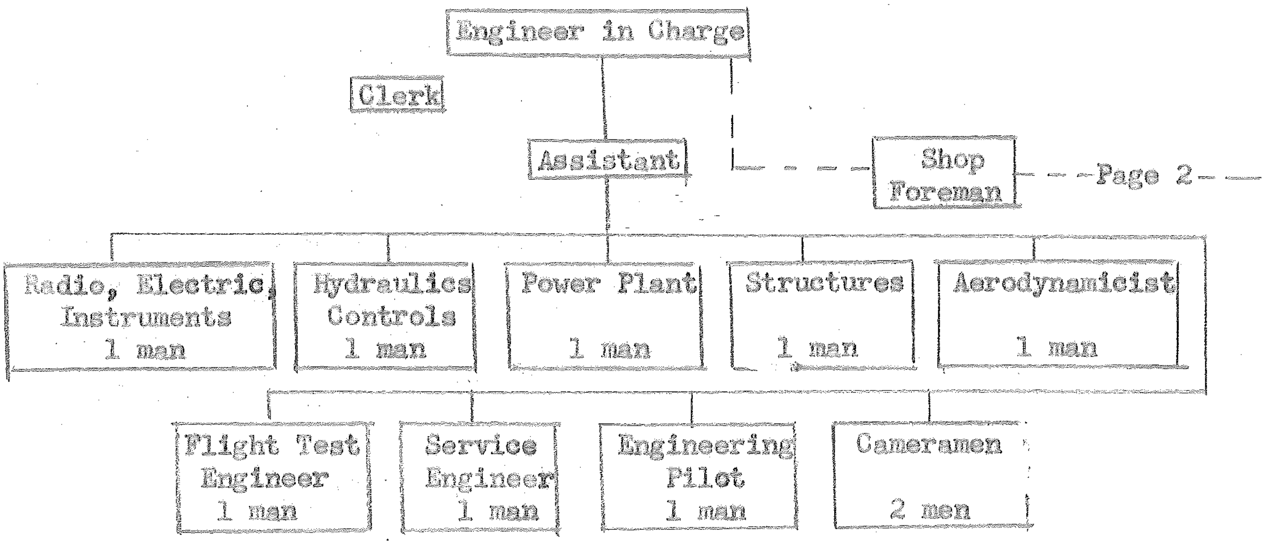
When the airplane is ready for free flight, the project will have completed the Moffett Field tethered flying and the ability to control the airplane in hovering will have been established. Also the power plant test stand would have been in operation a sufficient length of time to establish the reliability of the engine installation and the pilot's ability to control the rate of sink. Therefore, the last unusual problems to be explored are the ability of the airplane to go through its transition to level flight and pilot's ability to land the airplane in moderate winds.

If these problems are approached with austerity and an emphasis is placed on resourcefulness, sufficient answers can be found in ten hours of flying to qualitatively analyze the airplane's ability to perform its unique function.

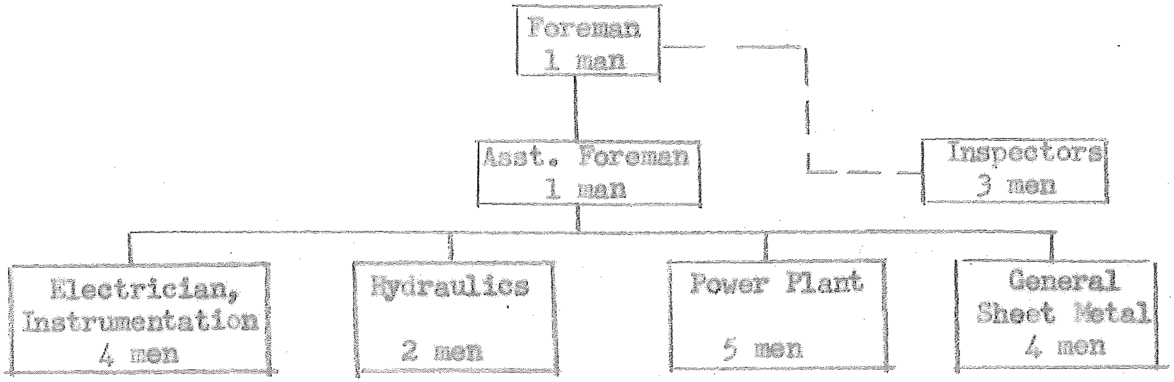
This task can be divided into two phases of flying:
First - A series of hovering flights with moderate displacements from the vertical.
Second - A series of flights through full transition.
The flights during these periods will be at low speeds and altitudes and only "safety" instrumentation activated.

An organization to accomplish this program is outlined below:

Engineering Personnel



Shop Personnel



This program can be accomplished with 30 men at 200 hrs./mo. in 4 months or 24,000 man hours.

CONVAIR

Date: ~~10~~ 14 April 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference:
(a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
(b) Minutes of Model 5 Flight Test Program Meeting of 6 March 1953
(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953
(d) MEMO J. F. SCHIRTZINGER TO R.C. PEDERSON dated 10 APRIL 1953

Enclosure:
(A) Cost Proposal Outline Serial #50-156-3 as revised ~~10~~ 14 April 1953 [illegible]

(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A), ~~Estimate is presented in breakdown form to facilitate compilation of total program costs by totalling the pertinent phase costs.~~ WHICH HAS BEEN REVISED TO REFLECT DELETION OF CERTAIN ENGINEERING TASKS WHICH ARE NOW SUB-CONTRACTED.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data	5.01	100 Man hours	$ 501
Materials & Direct Charges			$ 25
Experimental Mfg. Labor	@ $4.24	3,000 Man hours	$12,720

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data	5.01	~~9,700~~ 9333 Man hours	~~$48,597~~ 46758 $
Materials & Direct Charges			~~$ 3,120~~ 2240
Experimental Tooling Labor	@ $4.24	110 Man hours	$ 470
Experimental Mfg. Labor	@ $4.24	~~4,400~~ 1485 " "	~~$18,656~~ $ 6296

Notes: (1) The above costs are applicable to either of the alternate Security configurations.

(2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

Notes: (3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. Accomplishment of the Test Program as Described in Item 6.A.(3)

Design, Draft & Technical Data	@ $5.01	19400 20,100	Man hours	$97194 ~~[illegible]~~
Materials & Direct Charges		~~1,~~		~~$ 5,630~~ 4673
Experimental Tooling Labor	@ $4.24	1,300	Man hours	$ 5,512
Experimental Mfg. Labor	@ $4.24	9,400	" "	$ 39,856
Experimental Maintenance & Repair	@ $4.24	20,500	" "	$ 86,920
Flight Test Ground Hours	25			
Flight Test Flying Hours	25			
Total Test Hours	50	@ $16.00		$ 800
Fuel (Gal./Hr.) 420 x 50 Hrs.	@ $.22/gl	21,000	Gal.	$ 4,620
Oil (Gal./Hr.) 1 x 50 Hrs.	@ $12/gl	50	"	$ 60
Per Diem Allowance	@ $9.00	~~4,520~~ 4535		~~$ 40,680~~ 40815

Notes: (1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

(3) No provisions have been made for the operation of Aircraft by Service personnel.

(4) It is suggested that if this proposal is accepted, Enclosure (C) Report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Department.

(7) It is anticipated that Engineering Department will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

To: R. C. Pederson 10 April 1953

(8) Estimates submitted in Paragraph 2 above include an allowance of 2,975 Engineering Man Hours and 3,485 Experimental Factory Man Hours to allow for the effect of non-collectable work statement expansion.

2645

3215

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/H. W. Rouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore
Engr. Files

FAULIC

CONVAIR, SD

CONFIDENTIAL
SECURITY INFORMATION

Serial No. 50-196-3

Date: 11 March 1953
Revised: 10 April 1953
REVISED 15 APRIL 1953
Page 1

COST PROPOSAL OUTLINE

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

PILOT'S FAMILIARIZATION PROGRAM

1. **PROPOSAL REQUESTED BY:**

Model 5 Project Office (C. B. Carroll) - Confidential Memo to L. Moore dated 23 December 1952. Minutes of Model 5 Minimum Flight Test Program Meeting dated 6 March 1953.

2. **FOR SUBMITTAL TO:**

BuAer

3. **DATE PROPOSAL IS TO BE SUBMITTED:**

To be determined by Contract Department.

4. **TYPE OF BID DESIRED:**

Firm

5. **TYPE OF CONTRACT CONTEMPLATED:**

Amendment to NOa(s) 51-936-C (CPFF)

6. **GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:**

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight.

The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

CONFIDENTIAL
SECURITY INFORMATION

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES: (Cont'd)

The tethered flight gear should be so designed as to automatically prevent the airplane exceeding 8 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted.

The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

No test data not required for the above is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

No telemetering will be required for the test program at Moffett Field and no instrumentation wires would be required from the airplane. Adequate vibration warning devices would be installed in the cockpit and visual observation would be made during flight.

Radio communication will be provided between the pilot and the ground operator of the tethering equipment.

Wind conditions will not be explored in hangar.

The minimum Moffett Field program will be without autopilot.

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES (Cont'd)

The program and alternates to program for which cost estimates are to be submitted to the Customer are as follows:

A. Pilot's Familiarization Program Consisting of:

(1) Delivery and shipment of the airplane in accordance with Item 12.

(2) Design of test installations in accordance with Item I Engineering Design Task of the Detail Work Statement and Subcontract fabrication and erection of the installations including the Security provisions as described in Major Purchased Items Required, item 3a, and 4a and modification of the airplane in accordance with Item II.A. of the Detail Work Statement.

Note: Alternate figures are to be submitted for accomplishing this phase of the program with Security provisions deleted as described in Item 3b and 4b.

(3) Accomplishment of Test Program as outlined in the Detail Work Statement including Liaison and Maintenance and preparation of reports.

Note: Transportation ~~for~~ OF Convair Personnel at Moffett Field to be provided BY NAVY. It is assumed ~~such~~ THAT ANY ADDITIONAL transportation AWAY FROM BASE will be rented.

Note: Personnel assigned to Moffett Field test will be on a per diem basis. Living quarters will be arranged for at ~~or near~~ Moffett Field. ~~(San Jose and/or Palo Alto.)~~

7. DETAIL WORK STATEMENT

I Engineering Design task is as follows:

A. Proposal and General Study

B. Hoist and Tethering Controls Installation

- (a) Hoisting Mechanism
- (b) Counter Balance Mechanism
- (c) Automatic Control Equipment
- (d) Reels and Brake
- (e) Cable Assemblies
- (f) Pneumatic Snubber for Nose Cable
- (g) Pulleys, Idlers and Mounting
- (h) Tethering Line Installation

C. Hoisting Beam Installation

- (a) Beam Structure
- (b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation

- (a) Curtains at Arch 3, Doors and Corridor
  - (1) Curtain Catenary and Support Cables
  - (2) Curtain Reinforcement and Support Fittings
  - (3) Curtain Support Beam and Mast Rework
- (b) Cyclone Fence Installation
  - (1) At Arch 3
  - (2) At corridor
  - (3) At doors

7. DETAIL WORK STATEMENT (Cont'd)

E. Airplane Modifications

(a) Cable Attachment at Nose

(b) Tethering Line Attachment

(c) Installation of Tethering and Brake Controls

(d) Plane to Ground Communications

F. Procurement, Release and Check

G. Installation Liaison

(a) Mechanical

(b) Electrical

7. DETAILED WORK STATEMENT (Cont'd)

II. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to hoist and controls to accomplish Tethered or Captive condition. (NOSE SHAFT; CONNECTING BALL JOINT AND GUARD.)

B. Supply mechanics and electricians to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply PECULIAR spare parts, fittings, tools and equipment. ~~to maintain a "Shop" at Moffett Field.~~ Shop facilities will be made available by the Navy at Moffett Field.

~~D. Maintain, service and repair tethering equipment during test program.~~

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department ~~will~~ MAY be required to ~~handle~~ ASSIST IN this task.

~~F. Proof Loading Test of Hanger and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hanger structure and Hoist during the tethered flight test.~~

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practices. Two (2) full time inspectors will be required at Moffett Field for this purpose.

~~G. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus [illegible] an [illegible]~~

7. DETAIL WORK STATEMENT (Cont'd)

III. Experimental Flight Work Statement

A. The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

B. The tethered flight gear should be so designed as to automatically prevent the airplane exceeding 8 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted.

C. The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

D. No test data not required for the above is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

7. DETAIL WORK STATEMENT

IV. Aerodynamics Group

1. ~~A description of the aerodynamics task associated with the revised Moffett-Hangar captive flight program (reference (a)) is given below:~~

   ~~A. Investigate forces associated with design of tethering system in order to insure that mechanical restraints do not seriously affect flight hovering characteristics.~~

   ~~B. Make preliminary investigation of critical hovering handling characteristics from visual observations, film records and pilot observations, and/or studies necessary to impose possible undesirable handling qualities.~~

   ~~C. Work with pilots to develop suitable take-off and landing techniques.~~

   ~~D. Perform work necessary to develop suitable slipstream flow patterns in the cockpit area.~~

Aerodynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

V. Dynamics Group

Dynamics Group may be required to perform certain tasks peculiar to their function, on a liaison basis.

7. DETAIL WORK STATEMENT

VI. Instrumentation Group

The Instrumentation Group will be responsible for maintenance of instrumentation at Moffett Field as installed at San Diego, for minimum flight demonstration and pilot safety purposes.

Maintenance will include airborne equipment. ~~and also operation of ground data recording cameras.~~

7. DETAIL WORK STATEMENT (Cont'd)

VII. Engineering Test Laboratory

~~A. Engineer methods and means for obtaining all dynamic flight data required.~~

~~B. Engineer methods and means for obtaining temperature data as directed by the Experimental Flight Group.~~

~~C. Design calibration means and procedures, also auxiliary equipment as required.~~

~~D. Calibrate all dynamic pickups and associated recording equipment.~~

~~E. Take dynamic data and temperature data throughout the program. Edit data and provide preliminary analysis preparatory to presentation to Experimental Flight Department for detailed analysis and reports.~~

~~F. The foregoing dynamic test procedures will be applied specifically to the following scheduled operations only:~~

~~Flight operational technique.~~

~~Pilot familiarization operation.~~

A. ~~G.~~ Static Test of facility at Moffett Field. This task will be to supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast. Proof load to be applied as follows:

NOTE: THIS TASK TO BE ACCOMPLISHED BY SUB-CONTRACT.

(a) The empty tank will be raised a short distance above floor by means of the tethered gear.

(b) Water will be added in increments of 48,000 pounds proof load and deflection of the hanger will be measured for each increment of load.

TEST LAB REPRESENTITIVE TO BE PRESENT DURING TEST (2 WEEKS)

Note: The following items, which may come up in the course of this program are not to be included in this proposal but are to be quoted on separately after the requirements have been determined.

(a) Dynamic tests found to be necessary as a result of investigation of operational techniques or of pilot familiarization operations.

(b) Tests on airplane characteristics with or without Auto Pilot.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

1. North end of Hanger to Arch #3 except Shop area along West side.

2. Four (4) Mooring Masts

3. 8 Foot "Cyclone" wire fence (approx. 170 Ft.)

4. 5 - 30 Ft. Sections and 2 - 24 Ft. Sections of movable fence to be used as gates.

5. Monorail Cars and operators (4) to assist subcontractor and Convair in setting up Tethered flight test equipment.

6. Partitioned Office at East Side of Hanger between Arch #2 and #3.

7. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.

8. U. S. Marine Corps Guard for Security during entire Test Program.

9. Electric Power AND AIR SUPPLY. (4 MONTHS)

10. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)

11. Photo Lab. Facilities (CAMERAMAN, FILMS AND DEVELOPING)

12. Fire fighting equipment adequate for all possible emergencies during this type of test program.

13. First Aid and Emergency Hospital Facilities.

NOTE: Items No. 2, 3, and 4 may be omitted if Security provisions as shown on Drwg. 500504 are not required.

14. SHOP SUPPLIES - AN STANDARDS, RAW STOCK, BRAKES, DRILLS ETC.

15. HOUSING WILL BE FURNISHED AT MOFFETT FIELD FOR CONVAIR PERSONNEL

16. JET FUEL (21000 GAL. - J-P4)

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned. A Final Report of tests will be submitted to Customer.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel and Dural fabrication and erection
(b) Motor driven hoist assembly and installation
(c) Fabric (canvas) curtain manufacture and installation

11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's and Navy's Pilot Familiarization Program.
A Navy Evaluation Program if required will be separately quoted.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Model 5, Ship Number One, completely assembled except for propellers, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls

   Snubbing Cylinders (2)

   Counter Balance Cable Snubber

   Tail Cable Snubber

2. Hoist Beam Structure

3. Security Provisions (See Drwg. 50Y504) Maximum Requirements

   (a) Curtain Enclosures for entire test area
   (b) Alternate - Unit curtain enclosure.

13. MAJOR PURCHASED ITEMS REQUIRED: (Cont'd)

4. (a) 250 Feet of Cyclone Fencing. This purchased fencing plus fencing supplied by Navy at Moffett Field to be installed and priced as one contract.

(b) Alternate - Omit all fencing (Test area to be patrolled by Marine Guards)

5. Floor Protection. (See Rev. Drawing 5-02104) A 1/4" steel plate 12 feet square (one piece) shall be placed on existing concrete floor. Thermal insulation to be installed between steel plate and concrete floor.

Note: The above items will be manufactured and installed by Subcontractors by Personnel approved under Security Regulations. Sub-Contractors will be required to make available their representative at such times as believed necessary by Convair Test Supervisor. All Installations may be removed after test program is completed at customer's option, test installations may be left in place for future use. To be priced each way.

(MAJOR PURCHASED ITEMS REQUIRED CONTINUED ON PAGE 13a

14. CAPITAL FACILITIES REQUIRED:

Requirements are to be determined and separate list submitted.

15. PROPOSED PROGRAM SCHEDULE:

A. Engineering Final Release 1 June 1953

B. Tooling and Manufacture Completion 1 August 1953

C. Flight Program Completion -

December 15, 1953 - Pending availability of engine in June 1953.

16. APPLICABLE SPECIFICATIONS OR DESCRIPTIVE DATA AVAILABLE FOR ESTIMATING PURPOSES:

1. Drwg. 5-02104 "Proposal - XFY-1 Tethered Flight" Change "A"
2. "Moffett Field Trip Report" dated 29 November 1952
3. "Problem Statement Outline" date 23 December 1952
4. "Hoisting Test Rig for Installation in Moffett Field Hangar" ZM-5-02[illegible]
5. Cost Proposal Outline Serial No. 50-256-3 dated 11 March 1953 - Rev 15 April 1953
6. Security Provisions Drwg. 500504

REV. 15 APR. 1953

13. MAJOR PURCHASED ITEMS REQUIRED: (CONT.)

6. PROOF LOADING TEST OF HANGER AND HOIST WILL REQUIRE THE FABRICATION OF PLATFORM-TANK TO BE USED TO SIMULATE LOADS WHICH WILL BE IMPOSED ON HANGER STRUCTURE AND HOIST DURING THE TETHERED FLIGHT TEST.

~~4. 2a. Static Test of facility at Moffett Field.~~ This task will be to supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast. Proof load to be applied as follows:

(a) The empty tank will be raised a short distance above floor by means of the tethered gear.

(b) Water will be added in increments of 48,000 pounds proof load and deflection of the hanger will be measured for each increment of load.

7. THE SUB-CONTRACTOR OF THE TETHERED EQUIPMENT WILL BE REQUIRED TO FABRICATE, INSTALL AND MAINTANE, SERVICE AND REPAIR EQUIPMENT DURING TEST PROGRAM.

17. ENGINEERING COORDINATOR ASSIGNED: [illegible] B. Boyer PHONE NO. W-6611
Ext. 1764

18. SCHEDULE FOR DEPARTMENTAL COST ESTIMATES AND DATA TO BE SUBMITTED TO CONTRACTS DEPARTMENT (to be supplied by Contracts Department or arrived at in proposal meeting)

LMcDF:vj

Prepared by:
ENGINEERING PLANNING AND ESTIMATING

cc: J. H. Famme
C. B. Carroll/D. Soggs
W. W. Withee
J. L. Wainwright
R. White
P. D. Ferrara
G. W. O'Hare
J. C. Hoover
L. O. Cederwall
H. F. VonGoedel
W. J. Wood
R. L. Bayless
G. G. Green
R. H. Shick
A. Dublin
H. F. Dunholter
C. F. McCabe
R. A. Ackley
E. F. Strong
R. B. Thompson
W. S. Evans
J. J. Alkazin
L. J. Bordelon
H. R. Kennedy
E. D. Shannon
W. Martin
A. B. McFarland
R. C. Pederson

CONVAIR

CONFIDENTIAL
WORK SHEET.

10 APRIL
Date: ~~March~~ 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Pilot's Familiarization Program - Estimated Engineering, Experimental Flight and Experimental Factory Costs for

Reference: (a) Memo C. W. Power to R. C. Pederson dated 18 December 1952
(b) Minutes of Model 5 Flight Test Program Meeting of 6 March 1953
(c) Memo C. W. Power to R. C. Pederson dated 6 March 1953

Enclosure: (A) Cost Proposal Outline Serial #50-156-3 as revised ~~26~~ 10 APRIL ~~March~~ 1953
~~(B) Equipment List~~
(B) Report DA5-133 - Moffett Field Test Rig Load Analysis

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (a). Estimate is presented in breakdown form to facilitate compilation of total program costs by totalling the pertinent phase costs.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane (Navy Facilities)

Design, Draft and Technical Data @$5.01 100 Manhours $ 501
Materials & Direct Charges $ 25 8
Experimental Mfg. Labor @ $4.24 ~~10,520~~ 3000 Manhours ~~$44,605~~ 12720

Note: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc. as Described in Item 6.A.(2) of Enclosure (A)

Design, Draft and Technical Data 5.01 ~~11,270~~ 9700 Manhours ~~$56,[illegible]~~ 48597
Materials & Direct Charges $ 3120 ~~$2,705~~ ~~[illegible]~~
Experimental Tooling Labor @ $4.24 110 Manhours $ ~~466~~ 470
Experimental Mfg. Labor @ $4.24 ~~3,995~~ 4400 Manhours ~~$16,939~~ 18656

~~Note:~~ Notes:
(1) The above costs are applicable to either of the alternate Security configurations.

~~Note:~~ (2) Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

To: R. C. Pederson 26 March 1953

~~Note~~:(3) This estimate does not include costs for Convair to make a hanger analysis. See "Hanger Loads - Moffett Field Test Rig" Report ZM-5-027.

C. **Accomplishment of the Test Program as Described in Item 6.A.(3)**

Design, Draft & Technical Data	@ $5.01	~~18,620~~ 20100	Manhours	$ ~~93,286~~ 100701
Materials & Direct Charges				$ ~~5,750~~ 5630
Experimental Tooling Labor	@ $4.24	~~1,800~~ 1300	manhours	$ ~~7,632~~ 5512
Experimental Mfg. Labor	@ $4.24	~~12,500~~ 9400	"	$ ~~53,000~~ 39856
Experimental Maintenance & Repair	$4.24	~~22,900~~ 20500	"	$ ~~97,096~~ 86920
Flight Test Ground Hours	25			
Flight Test Flying Hours	25			
Total Test Hours	50 @ $16.00			$ 800
Fuel (Gal./Hr.) 420 x 50 Hrs.	@ $.22/gl	21,000	Gal.	$ 4,620
Oil (Gal./Hr.) 1~~0~~ x 50 Hrs.	@ $12./gl	50~~0~~	Gal.	$ ~~6,000~~ 60
Per Diem Allowance	@ $9.00	~~4,700~~ 4520	~~Man Days~~	$ ~~42,300~~ 40680

Notes:

~~Note~~:(1) Estimate for Spare Purchased Parts and Materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

~~Note~~:(2) Transportation (At Moffett Field) Costs to be supplied by Estimating Department.

~~Note~~:(3) No provisions have been made for ~~this~~ THE operation of Aircraft by Service personnel.

~~Note~~:(4) It is suggested that if this proposal is accepted, Enclosure (C) Report DA5-133 - Moffett Field Test Rig Load Analysis, should be submitted to BUYRD for approval and/or information.

~~Note~~:(5) Estimating Department to supply costs for continuous inspection at Moffett Field. It is assumed that two inspectors for 4 months will be required.

~~Note~~:(6) Costs for Capital Facilities and shipment of same to Moffett Field and return to San Diego to be supplied by Estimating Dept. ~~(See Enclosure (B) "Equipment List"~~.

~~Note~~:(7) It is anticipated that Engineering Dept. will be operating on a 45 hour work week during this program and approximately 15% of the Direct Labor will require premium pay. The

Experimental Factory will be operating on a 2 shift 50 hour work week with overtime as required. Provisions should be made for premium pay on approximately 20% of Experimental Factory Direct Labor.

J. F. Schirtzinger
Assistant Chief Engineer

LM:DKF:vj

cc: F. W. Fink/N. W. Bouley
J. Famme/C. B. Carroll
J. S. Blakely
L. Moore
Engr. Files

(8) ESTIMATES SUBMITTED IN PARAGRAPH 2 ABOVE INCLUDE AN ALLOWANCE OF 2975 ENGINEERING MANHOURS AND 3485 EXPERIMENTAL FACTORY MANHOURS TO ALLOW FOR ~~BECAUSE OF~~ THE ~~FOLLOWING FACTORS: (1)~~ EFFECT OF NON-COLLECTABLE WORK STATEMENT EXPANSION, ~~(2) CORRECTION FOR NEGOTIATING CHARACTERISTICS OF CUSTOMERS ON SPECIFICATION, PROCEDURES, AND ACCEPTANCE.~~

$ 367270.

2. ESTIMATED ENGINEERING COSTS

A. DELIVERY AND SHIPMENT OF AIRPLANE (NAVY FACILITIES)

DESIGN, DRAFT AND TECHNICAL DATA	@ $5.01	100 M/HRS.	$501
MATERIALS & DIRECT CHARGES			$25
EXPERIMENTAL MFG. LABOR	@ $4.24	3,000 ~~2700~~ M/HRS.	~~$11448~~

B. DESIGN OF TEST INSTALLATIONS, ETC

DESIGN, DRAFT & TECHNICAL DATA	@ $5.01	9,200 ~~8525~~ M/HRS.	~~$42710~~
MAT'LS & DIRECT CHARGES			~~$2850~~
EXPERIMENTAL TOOLING LABOR	@ $4.24	110 M/HRS.	$470
EXPERIMENTAL MFG. LABOR	@ $4.24	4,400 ~~3995~~ M/HRS.	~~16940~~

C. ACCOMPLISHMENT OF THE TEST PROGRAM

DESIGN, DRAFT & TECH. DATA	@ 5.01	20,100 ~~18300~~	~~$91685~~
MAT'L & DIRECT CHG.			~~$5,200~~
EXP. TOOLING LABOR	@ 4.24	1,300 ~~1200~~	~~$5088~~
EXP. MG. LABOR	@ 4.24	9,400 ~~8520~~	~~$36125~~
EXP. MAINTENANCE LABOR	@ 4.24	20,500 ~~18700~~	~~$79288~~
TOTAL TEST HOURS	@ 16.00	50	800
FUEL (GAL/HR.) 420 x 50	@ $.22/GAL	21000 GAL.	4620
OIL (GAL/HR 1 x 50	@ $12.00	50 GAL.	600
PER DIEM ALLOWANCE	@ 9.00/DAY	4520 M/D	40680
			$338,500

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 3 March 1953

TO L. Moore, Planning and Estimating

SUBJECT Model 5 - Detail Work Statement - Pilot's Familiarization Program, Moffett Field

DETAIL WORK STATEMENT

In estimating the cost of the pilot's familiarization program, assume that pilot is familiar with the power controls on the engine test stand and has operated same.

(1) Vertical flights at slow speeds (3 ft/sec^2) (4 flights of 30 min. each)

(2) Transverse flights at constant altitude (4 flights of 30 min. each)

(3) Combinations of (1) and (2) above (12 flights of 30 min. each)

Total time - 10 hours.

Allow 25 hours flight and three months elapsed time.

The same instrumentation will be used as referred to in C. B. Carroll's memo of 24 February 1953 to L. Moore, subject: "Detail Work Statement - An Abbreviated Test Program for the XFY-1 Airplane".

CBCarroll

C. B. Carroll
Project Engineer

cc: E. D. Shannon

M. F. Pilot Fam

Some inst as mod.

~~Pilot~~ Assume familiar with

Eng test ~~stand~~

1. Make slow (3'/sec?)

Vert. flts. (4 flts max 30 min)
2 hrs.

2. Maneuvering must alt.,
check for ability to control
~~side~~ transverse motion
(4 flts max 30 min)
(2 hrs)

3. Combine 1 & 2 above.

(12 flts max 30 min)
6 hrs.

Same form as
in mod flt. prog.

~~Total pilot time~~
10 hrs/pilot

3 months.

assume 50 flts
or 25 hrs.

CONVAIR, San Diego

24 February 1953

Memo to: L. Moore, Planning and Estimating

Subject: Detail Work Statement - An Abbreviated Test Program for the XFY-1 Airplane

Reference: (a) C.B.Carroll memo dated 9 Feb. to L. Moore subject: Detail Work Statement - Revised Flight Test Program

The reference memo is a detail work statement of the XFY-1 flight test program in accordance with Specification SR-38E-1, Addendum XFY-1 dated 4 May 1951. The program as outlined has been discussed in detail with Experimental Flight Group and as a result it is considered desirable to quote on an abbreviated program.

DETAIL WORK STATEMENT

In estimating the cost of this abbreviated program, make the following assumptions:

(1) The engine test stand program, as presently conceived, has been completed.

(2) The tethered flight program has been completed using only the instrumentation to be made available for the flight test program. The tethered flight program has shown adequate control and visibility in vertical and near-vertical flight in nearly calm wind condition.

The following instrumentation will be installed in only one of the airplanes:

(a) Temperatures to be recorded on a Brown recorder mounted in the airplane. The temperatures measured to be only those found to be critical from test stand operation.

(b) A photo panel will be used only to monitor engine operation for safety and reliable operation.

(c) A warning system will be provided to warn the pilot of fire, turbine vibration, or other critical conditions found to exist during test stand operation, hydraulic control stand tests, or tethered flight tests.

(d) Install in both airplanes that wiring, instrumentation, or instrumentation equipment which is required for the complete SR-38E-1 program and which cannot be installed after the airplane is constructed.

Flight testing is to be essentially qualitative in nature and may be limited to the following:

(1) A minimum of 20 successful take-offs and landings with transition into and out of level flight. The wind conditions to be noted for each take-off and landing and need not exceed any specified value. Each take-off and landing is to be photographed in slow motion and real time moving pictures.

(2) Operations above 20,000 feet need not be demonstrated. Satisfactory operations up to 20,000 feet to be demonstrated by making a minimum of five (5) different flights to that altitude.

(3) The maximum speed demonstrated in this abbreviated program need not exceed .55 Mach number.

(4) Demonstration that the airplane is reasonably safe to fly from a structural integrity viewpoint may be made by application of a 3g loading at the maximum speed obtained. Only moderate maneuvers to be required and these to be tested and witnessed in a qualitative manner.

The estimated elasped time is:

First flight one month after completion tethered flight program.

Four months required to complete the demonstration.

C B Carroll

C. B. Carroll
Project Engineer

cc: R. A. Ackley/T.R. King
N. W. Bouley
M. Dublin
H. F. Dunholter
J. H. Famme
P. D. Ferrara
G. G. Green
G. W. O'Hare
J. C. Hoover
E. D. Shannon/Edelstein
R. H. Shick
J. F. Schirtzinger
J. L. Wainwright
R. P. White
W. W. Withee
Model 5 P/O

543A

CONVAIR

INTRA - COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

Convair, S.D.

Serial #50-156-3
Date [illegible] March 1953
Page 9

DATE 10 March 1953

TO Dave Faulk, Engineering Planning & Estimating

SUBJECT Work Statement for Proposed Tethered Flight Test Program - Model 5

7. DETAIL WORK STATEMENT
V. INSTRUMENTATION GROUP

It is understood that subject program will be conducted at Moffett Field or other remote base.

AT MOFFETT FIELD

The Instrumentation Group will be responsible for maintenance of instrumentation as installed at San Diego, for minimum flight demonstration and pilot safety purposes. (Reference memo of 10 March 1953, E. D. Shannon to L. Moore.) Maintenance will include airborne equipment and also operation of ground data recording cameras.

Minor modifications, additions, deletions, etc., may be accomplished upon request of Exp. Flight Group. However it is our understanding that major deviations will not be made in initial instrumentation configuration. (It is assumed that a two-shift operation will be in effect at Moffett.)

RB Thompson

R. B. Thompson, General Foreman
Instrumentation Group

RBT/ph

cc: C. F. McCabe
E. Strong
E. D. Shannon
C. A. Judd
T. R. King
File

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 10 March 1953

TO Mr. L. Moore - Engineering Planning and Estimating

SUBJECT Proposed Work Statement for Tethered Flight Program

SERIAL #50-156-3

Page 7

7. DETAIL WORK STATEMENT (CONT)
III. EXPERIMENTAL FLIGHT WORK STATEMENT

A The tethered flight program for the Model 5 airplane has been reduced to three months elapsed time and 25 hours flight time. (The flight program elapsed time with the airplane in operating condition at Moffett Field.) Fuel and oil estimate should be based on a total of 50 hours engine operation.

B The tethered flight gear should be so designed as to automatically prevent the airplane exceeding 8 feet per second rate of sink and to successfully restrain the airplane in ascent to the maximum performance value predicted.

C The purpose of the tethered flight program is only to develop pilot technique for landing and to demonstrate the ability of the pilot to take-off, hover in vertical flight, and safely land.

D No test data not required for the above is to be furnished. The instrumentation to be installed is the same as will be used in the flight demonstration which is primarily for the purpose of monitoring safe operation of power plant, control system, airplane, etc. The operation to be photographed with real and slow motion movie camera.

E. D. Shannon
Chief of Experimental flight

EDS:Lf

543A

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

Page 8

DATE 10 March 1953

TO Planning & Scheduling

SUBJECT Model 5 Captive Flight Program in the Moffett Field Hangar

REFERENCE: (a) MINUTES OF MODEL 5 MINIMUM FLIGHT TEST PROGRAM MEETING, dated 6 March 1953 by C. B. Carroll.

7. DETAILED WORK STATEMENT
IV AERODYNAMICS GROUP

1. A description of the aerodynamics task associated with the revised Moffett Hangar captive flight program (reference (a)) is given below.

A. Investigate tares associated with design of tethering system in order to insure that mechanical restraints do not seriously affect flight hovering characteristics.

B. Make preliminary investigation of critical hovering handling characteristics from visual observations, film records and pilot observations, make studies necessary to improve possible undesirable handling qualities.

C. Work with pilots to develop suitable take-off and landing techniques.

D. Perform work necessary to develop suitable slipstream flow patterns in the cockpit area.

Ralph Shick
R. H. Shick
Chief of Aerodynamics

GROUP ESTIMATE AND CHECK-OFF LIST

SERIAL NO. 50-156-3

NOTES:

MODEL 5 (XFY-1) TETHERED FLIGHT TEST AT MOFFETT FIELD
PILOTS FAMILIARIZATION PROGRAM

1. ESTIMATES ARE TO BE SUBMITTED FOR FLIGHT TEST PROGRAM DESCRIBED IN COST PROPOSAL OUTLINE #50-156-3 dated 11 MARCH 1953

2. ESTIMATES TO BE SUBMITTED TO PLANNING & ESTIMATING BY 17 MARCH 1953.

3. IT IS REQUESTED THAT A DETAILED BREAK DOWN BE SUPPLIED INCLUDING NUMBER OF PERSONNEL AT MOFFETT FIELD AND AT SAN DIEGO.

NUMBER AND TYPE ARTICLES: TETHERED FLIGHT TEST OF MODEL 5 AIRPLANE AT MOFFETT FIELD.

TYPE OF BID: FIRM
TYPE CONTRACT ANTICIPATED: CPFF
WING SPAN:
FUSELAGE LENGTH:
MAXIMUM FUSELAGE HEIGHT:
MAXIMUM FUSELAGE WIDTH:
GROSS WEIGHT:
WEIGHT EMPTY:

CVAC FABRICATED WEIGHT (APPROXIMATE):
TACTICAL ______ STRIPPED ______ STATIC TEST ______

TYPE DRAWINGS: EXPERIMENTAL
COMPLIACE WITH MIL-D-5480A AND MIL-D-5481:
TYPE HANDBOOKS:

TYPE MANUFACTURE: EXPERIMENTAL

	ACTIVITY ☒ = ESTIMATE REQUESTED	SHIPMENT OF PLANE	DESIGN AND FACILITIES	FLIGHT TEST	LIAISON & MAINTENANCE				
DESIGN GROUPS	COMMON RELEASES	☐	☐	☐	☐	☐	☐	☐	☐
	DESIGN AND DRAFTING (INCLUDING LEAD DESIGNER)	☐	☐	☐	☐	☐	☐	☐	☐
	ABM'S AND MATERIAL FOLLOW-UP	☐	☐	☐	☐	☐	☐	☐	☐
	SYSTEM OUTLINES AND/OR DESCRIPTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	HANDBOOK INFORMATION AND FOLLOW-UP (INCLUDING PARTS DESCRIPTIONS)	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	ISOMETRIC DRAWINGS	☐	☐	☐	☐	☐	☐	☐	☐
	PROOFING LIAISON AND CORRECTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	CHECKING	☐	☐	☐	☐	☐	☐	☐	☐
	WEIGHT CALCULATIONS	☐	☐	☐	☐	☐	☐	☐	☐
	OUTLINE DRAWINGS AND PROCUREMENT SPECS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
ALL GROUPS	LIAISON AND ENGINEERING MAINTENANCE INCLUDING COORDINATION WITH OTHER DEPTS. AND GROUPS AT THE FOLLOWING PERIODS. (NO. MEN OR FRACTION)								
	COMPLETION OF DESIGN RELEASE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION FIRST AIRPLANE	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	SHOP COMPLETION AIRPLANE NO.	☐	☐	☐	☐	☐	☐	☐	☐
	LAST MONTH SHOP ACTIVITY	☐	☐	☐	☐	☐	☐	☐	☐
	AVERAGE DURING FLIGHT TEST	☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL GROUPS	ACTIVITY SUPPORTING ORIGINAL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	TESTING AND REPORTS	☐	☐	☐	☐	☐	☐	☐	☐
	TECHNICAL DATA AND REPORTS (STRESS ANALYSIS, WT. REPORTS, SPEC, ETC.)	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
SERVICE PUBLICAT S	HANDBOOKS (ORIGINAL ISSUE)								
	FLIGHT OPERATING INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ERECTION AND MAINTENANCE INSTRUCTIONS	☐	☐	☐	☐	☐	☐	☐	☐
	ILLUSTRATED PARTS BREAKDOWN	☐	☐	☐	☐	☐	☐	☐	☐
	STRUCTURAL REPAIR	☐	☐	☐	☐	☐	☐	☐	☐
	PARTS APPLICATION DATA LIST	☐	☐	☐	☐	☐	☐	☐	☐
	DETAIL LUBRICATION LIST	☐	☐	☐	☐	☐	☐	☐	☐
	CFE LIST	☐	☐	☐	☐	☐	☐	☐	☐
	INSPECTION REQUIREMENTS	☐	☐	☐	☐	☐	☐	☐	☐
	CONTRACTOR SERVICE BULLETINS	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐
DEPT. 61	MODEL DESIGN	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL DIRECT LABOR	☐	☐	☐	☐	☐	☐	☐	☐
	CVAL TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
	COOP TUNNEL OCCUPANCY	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
EXPERIMENTAL FACTORY	MODEL FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	MISC. TEST FABRICATION	☐	☐	☐	☐	☐	☐	☐	☐
	TEST OPERATION ASSISTANCE	☐	☐	☐	☐	☐	☐	☐	☐
	MOCK-UP CONSTRUCTION AND MAINTENANCE	☐	☐	☐	☐	☐	☐	☐	☐
	TOOLING	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - STATIC TEST	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #1 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #2 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
	FABRICATION AND ASSEMBLY - #3 FLIGHT ARTICLE	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐
	AIRPLANE MAINTENANCE DURING FLIGHT TESTS	☐	☐	☐	☐	☐	☐	☐	☐
	TOTAL MAN-HOURS	☐	☐	☐	☐	☐	☐	☐	☐

TOTAL MAN-POWER:																								
REQUIRED BY MONTH																								
MONTHS AFTER GO-AHEAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

APPROVED:

CONSOLIDATED VULTEE

DIVISION San Diego

MODEL

REPORT ZM-5-027

DATE 4 March 1953

TITLE

HOISTING TEST RIG FOR INSTALLATION IN MOFFETT FIELD HANGAR

PREPARED BY D.B. Suggs
D. B. Suggs

GROUP

REFERENCE

CHECKED BY

APPROVED BY
Project Engineer

NO. OF PAGES

NO. OF DIAGRAMS

REVISIONS

NO.	DATE	BY	CHANGE	PAGES AFFECTED

60 241A

CONVAIR - San Diego

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

MAR 9 1953 P+E

6 March 1953

R. C. Pederson

Contract NOas 51-936-c - Model XFY-1 Airplanes
Revised SR-38 Flight Tests and Moffett Field Tests

Reference (a) D. H. Digges Memo to R. C. Pederson dated 16 January 1953
(b) D. H. Digges Memo to R. C. Pederson dated 8 January 1953
(c) D. H. Digges Memo to R. C. Pederson dated 7 January 1953
(d) Meeting of representatives of all groups concerned at Project Office on 6 March 1953

1. References (a), (b) and (c) requested cost estimates for subject SR-38 Flight Tests and Moffett Field Tests.

2. At a conference with Bureau representatives at San Diego yesterday, it was established that the following cost estimates for subject tests should be submitted to the Bureau at an early date:

(a) Full compliance with SR-38 as amended by Addendum XFY-1 dated 27 April 1951.

(b) A minimum, non-compliance with SR-38 flight program.

(c) A minimum "pilot's familiarization" Moffett Field program.

3. Reference (d) meeting was held for the purpose of familiarizing all concerned with the final approach to subject tests. CPO's are to be furnished your department by 25 March 1953. The CPO's for items (b) and (c) above will be prepared with the limitation of substantially remaining within the amount of funds originally proposed to the Bureau for the flight program.

4. Considering the urgency of this revised test program, it is requested that cost estimates for items (a), (b) and (c) in paragraph 2, above, be furnished this department as expeditiously as possible.

CW Power
for C. W. Power
Navy Contracts Administration Supervisor

LHL:mmm

cc: C. B. Carroll
L. Moore
C. L. Meador
C. W. Power (3)
51-936-c Chron

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

NOTE & RETURN TO

		INIT. DATE
1		3/13
2		
3	Hynie	3/13
4		
5	~~Pikins~~	
6		
7	Faulk	
8		
9		
10		

Dave Faulk
Planning & Estimating

CONVAIR, San Diego

MAR 9 1953 P&E 6 March 1953

MINUTES OF MODEL 5 MINIMUM FLIGHT TEST PROGRAM MEETING

A meeting was held in the Model 5 Project Office 3/6/53 to outline the requirements for a minimum flight test program on Model 5 airplane, as discussed with Lt. Col. Clasen and Comdr. Sherby during their visit to Convair 3/5/53.

Attending:

D. Alley
E. Boteler
C.B. Carroll
J. Coleman
M. Edelstein
J. Famme
D. Faulk
T. King
W. Lewis
L. Lobel
J. Mason
L. Moore
J. Perkins
E.D. Shannon
D. Suggs
R. Thompson

1. The Contracts Department representative, Mr. Lobel, opened the meeting by outlining briefly how the cost proposal should be submitted.

   (a) Complete proposal for SR-38 compliance will be submitted. As an alternate a very minimum program would be proposed and recommended.

   (b) A cost estimate will be submitted on the Moffett Field tests for a minimum program. The minimum program will be a very minimum required for pilot familiarization only.

   (c) The minimum flight test program and Moffett Field program should be figured so that the combined cost of the two does not exceed the test funds already allocated to the Model 5 program.

2. The information to be obtained from the Moffett Field tests was outlined by Mr. Shannon of the Flight Test Department representative as follows:

   (a) Prove that the concept of a vertical rising airplane is a practical idea. Accomplish this at a minimum cost, with adequate safety provided. A minimum test program to familiarize a group of pilots to prove that they can control the airplane, take off, land and hover. Prove function of major systems and controls.

   (b) No attempt will be made to see how fast the airplane can be accelerated. Will not accelerate at speeds more than 3 or 4 feet per second if airplane can be controlled at those speeds for take-off, hover, etc. It was estimated that the speed of acceleration should not exceed 10 ft. per second at any time.

   (c) Wind conditions will not be explored in hangar.

   (d) The minimum Moffett Field program will be without autopilot. If the pilot cannot control the airplane without autopilot, the airplane is not acceptable and further engineering work will be required.

3. Instrumentation

(a) It was the opinion of the Flight Test Department that instrumentation report for SR-38 could not be reduced very much; however, this should be checked to be sure that it is kept to a minimum. Instrumentation is to be installed initially on one airplane only. It was pointed out by the Instrumentation Group representative that wires and equipment which are not accessible after the airplane is assembled should be installed at time of assembly in both airplanes to meet SR-38. Otherwise instrumentation will be installed on one airplane only until needed on the second.

The flight representative stated that instrumentation should be kept to the bare essentials to be chiefly safety instrumentation. Costs are to be kept within funds available.

The Dynamics Group representative warned against cutting instrumentation too severely on items which may cost considerably more to install later. The Project Office representative pointed out that this would have to be a calculated risk if we were to stay within funds available.

It was agreed that no telemetering would be required for the initial test program at Moffett Field and also that no instrumentation wires would be required from the airplane. Adequate vibration warning devices would be installed in the cockpit and visual observation would be made during flight. Complete photographic coverage will be required on all flights.

Radio communication will be provided between the pilot and the ground operator of the tethering equipment.

4. Cost Proposal Outline

New cost proposal outlines will be prepared for (a) complete SR-38 compliance, (b) minimum flight test program, and (c) Moffett Field test program.

These are to be distributed to the various groups concerned by Wednesday (3/11/53) for review, and are to be released by Planning and Estimating by the following Wednesday 3/18/53.

CBCarroll

C. B. Carroll
Project Engineer

CBC:DS:rb

cc: R.L. Bayless
G.G.Green/J. Adamson
J.F.Schirtzinger

Doc Jan 6, W.S.
11, 657

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

29 November 1952

MOFFETT FIELD TRIP REPORT

A visit was made to Moffett Field November 24 and 25 by Lt. W. C. Bergstedt of the Convair Navy BAR Office and D. B. Suggs of Convair Engineering Department. The purpose of this trip was to obtain detail information concerning the proposed installation of a Model 5 tethered flight test airplane in the No. 1 Moffett Field Dirigible Hangar.

Moffett Field personnel contacted were as follows:

Capt. B. B. Nichol - Commanding Officer at Moffett Field
Cmdr. H. C. Rowe - Public Works Officer
Cmdr. G. J. Frauenheim - Operations Officer
Cmdr. E. G. Osborn - Executive Officer
Mr. Morriss M. Viele - Public Works Design Director

The excellent cooperation and courtesy extended by these men resulted in the complete success of this mission.

1. Mr. Viele and his personnel spent considerable time in pulling the necessary hangar structure drawings from the files, for our inspection. After looking through these, the desired ones were selected for prints to be made. Three prints each of 16 drawings were obtained.

2. An inspection tour of the hangar was made on Monday with Commander Rowe, Commander Frauenheim and Mr. Viele, on the ground floor as well as through the upper levels in the hangar structure. This was repeated several times by Lt. Bergstedt and the writer. Photos were taken in the north end of the hangar at the proposed test location and the roof structure was photographed in detail.

3. Commander Frauenheim arranged for an airplane engine to be operated in the hangar at the proposed test site. An S.N.J. airplane was used for this purpose, which Commander Frauenheim stated is one of the noisiest airplanes in the Navy. The airplane was positioned in the center of the hangar approximately 140 feet from the end of the hangar with the propeller blast directed toward the closed doors which form the end of the hangar. The engine was run at military power for approximately five minutes and the following was observed:

(1) Noise in the immediate vicinity of the airplane was estimated to be approximately 110 db. (Quite severe in the general locality adjacent to airplane but was not considered excessive in shops and offices 300 ft. or more away.) It was recommended, however, that operations requiring engine running be accomplished at night, after other work in the hangar has ceased. Personnel are working there all hours except from 2:30 A.M. to 7:00 A.M.; however, there is not as much activity after 8:00 P.M.

(2) Exhaust contamination was not at all noticeable.

(3) Air flow from the propeller blast had little or no effect on the circulation of air within the hangar. Banners hanging inside the building adjacent to the doors on each side and approximately 75 ft. high did not move during

engine run. Also canvas "No Smoking" signs on the door inside and approximately 50 ft. high showed no sign of turbulent air. Dust on the floor was blown against the door and curled upward approximately 20 ft.

4. The hangar structure appears to be "grossly adequate" for supporting the proposed test loads for any condition. Mr. Viele estimated that the crane monorails would support approximately 14,000 pounds each at the main arches for the hangar roof structure. The monorail attachment at present is through (6)-3/4 rivets in shear and (4)-3/4 bolts in tension. This could be easily reinforced to carry a much greater load if desired. It is proposed that a steel truss be provided by Convair which will attach to the four center monorails. This would be located directly under main hangar arch No. 1 which carries the "clam shell" door loads at the top and is 40 ft. from the gable arch at the end of the hangar. This puts the test airplane approximately 140 ft. from the inside of the doors at the floor and approximately 140 ft. from the security curtain across the hangar at arch No. 3.

5. The VX5 Development Air Group is operating in the offices and shops on the west side, at the north end of the hangar. It is necessary that the Model 5 tests be arranged and conducted in a manner that will not interfere with the activities of this group. A tunnel approximately 12 ft. wide, 12 ft. high and 140 ft. long would be required to provide access from these offices and shops to the hangar and still give security for the test. A security curtain could be located at hangar arch No. 3 and supported from a catenary stretched across the hangar from the main arch pin 55 ft. above the floor. Several mooring masts are available for supporting the cable at intermediate points. Eight-foot cyclone fencing with barbed wire on top is available for fencing the area, as required. It will be necessary that a 45 ft. wide gate be provided for moving airplanes through in case of fire. Sections of fencing with wheels are available at Moffett Field for this purpose. Fencing and curtains must also be provided at the end of the hangar to give security from outside the hangar with the doors open. The curtains may be attached to the doors for this purpose. Marine guards are available for enforcing security as required.

6. Adequate space for test house, shop and office requirements are available on the east side of the hangar adjacent to the airplane. All machine shop facilities in the hangar or at Ames Lab on the field can be made available. Also, there is a complete shop available at Alameda, 20 miles away.

7. There is no sprinkling system installed in the hangar but there are numerous fire hydrants and two Cardox trucks available.

8. It will be necessary that an expense budget be set up to cover cost on all phases of the work to be done at Moffett Field. This is to cover any work to be done by shop and maintenance personnel and to pay for utilities or any expenses in connection with the operation. Erection of the security tunnel, fence, curtains, roof truss, test rig and test facilities will be Convair's responsibility.

9. Capt. B. B. Nichol stated that housing facilities could probably be provided on the base for the Convair personnel. It was estimated by the writer that approximately 12 to 15 men would be required to accomplish these tests, that they would require approximately 3 months to complete and would start in July or August of next year.

10. The space in which the tests are proposed to be run is normally occupied by VX-5 with provision for servicing blimps periodically. The blimp arrives from Oakland for maintenance inspections as well as for haven from high winds. During the maintenance periods it is housed in the north end of the hangar for approximately ten (10) days. Since the security of the tests would be compromised or the tests would have to be suspended (including removal of the curtain catenary), it will be necessary for arrangements to be made through the Bureau of Aeronautics to have the blimps serviced elsewhere for the duration of the tests. Capt. Nichol stated that he thought this could be arranged satisfactorily.

D. B. Suggs
D. B. Suggs

cc: Capt. B. B. Nichol, Moffett Field (3)
Cdr. C. W. Stirling, Navy Office
Lt. W. C. Bergstedt, Navy Office
R. L. Bayless
N. W. Bouley
C. B. Carroll
F. W. Davis
J. H. Famme
F. W. Fink
J. O. Pike
E. D. Shannon
D. B.Suggs

CONVAIR

17 December 1952

L. H. Lobel, Contracts Dept.

Contract NOa(s)51-936, Model XFY-1 Airplane;
Restrained Hovering Tests

eference: (a) CVAC confid. ltr. to BuAer 6-2376, dated 5 May 1952
(b) BuAer confid. ltr. to CNO Aer-AC-28 012546 dated 20 June 1952
(c) ComAF,Pac.Fleet 2nd End. on BuAer ltr (Ref. (b))to CNO, Serial 01912, dated 9 Sept. 1952
(d) CNO confid ltr to BuAer Op-502G3B/jk Ser 0657P50 dated 29 Sept. 1952
(e) BuAer confid ltr BAR San Diego and NAS Moffett Field Aer-AC-251 Ser 019742 dated 10 Oct. 1952

closure: (A) One copy Dwg. 5-02104 "Proposal - XFY-1 Tethered Flight"

1. Reference (a) stated in paragraph 6: "The contractor requests that he be notified as soon as possible whether the Moffett Field hangar could be made available during the early part of 1953. Upon receipt of this information, the contractor will proceed with a formal program that will list the various items of equipment and structural gear required."

2. Reference (d) informed the contractor that permission had been received to use Moffett Field dirigible hangar for these tests.

3. It is requested that a formal cost proposal be compiled and submitted to BuAer for action.

C. B. Carroll
Project Engineer

cc: L. Moore
D. Suggs
Model 5 P/O

CONVAIR - San Diego

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SECURITY INFORMATION

18 December 1952

R. C. Pederson

Contract NOas 51-936-c - Model XFY-1 Airplanes
Tethered Flight Tests at Moffett Field

Enclosure (1) One (1) copy Drawing 5-02104 "Proposal - XFY-1 Tethered Flight"

1. The Bureau has approved the use of the Moffett Field Hangar for hovering flight tests for the Model 5 airplane. D. B. Suggs, Engineering, is in charge of the arrangements for the proposed tests. Enclosure (1) was prepared as a result of the recent survey visit to Moffett Field by Mr. Suggs.

2. It is requested that you furnish this office a cost estimate for the accomplishment of the Moffett Field tests. It is anticipated that such cost estimate will include, among any other costs, the following items: transportation of the airplane and CVAC personnel to Moffett Field; fabrication of tethering equipment, landing platform, hoisting devices, etc.; security provisions; shop and maintenance facilities and CVAC personnel facilities. The Model 5 Project Office will, upon request, furnish you with the problem statement.

C. W. Power
Navy Contracts Administration Supervisor

LL:mmm

cc: C. B. Carroll
L. Moore
W. Brown
C. Meador
C. W. Power (3)
51-936-c File

NOTE & RETURN TO

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543A

CONVAIR

INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

ATE 23 December 1952

O L. Moore, Planning and Estimating Group

UBJECT C.P.O. for Model 5 Tethered Flight Tests at Moffett Field

eference: (a) Contracts Dept. (C.W.Power) confid memo to R.C. Pederson dated 18 December 1952

nclosure: (A) One copy Problem Statement Outline for Model 5 Tethered Flight Installation in Moffett Field Hangar, dated 23 December 1952

1. The work statement as outlined in Enclosure (A) is to be used in the preparation of the cost proposal outline for this program.

2. Mr. D. B. Suggs of the Model 5 Project Office has been assigned as design specialist in charge of the Moffett Field test program.

3. Your cooperation with Mr. Suggs in this matter will be appreciated.

CBCarroll
C. B. Carroll
Project Engineer

cc: D.B.Suggs
Model 5 P/O

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CONVAIR, San Diego

23 December 1952

Memo to: C. B. Carroll

Subject: Problem Statement for Model 5 Tethered Flight Installation in Moffett Field Hangar

In summation of a meeting held in the Model 5 Project Office December 19 with the various groups concerned, the following problem statement was arrived at. This outline will be used as the basis for obtaining cost proposals for the subject installation.

Those present for this meeting were as follows:

✓D. J. Alley
E. W. Boteler
C. B. Carroll
J. F. Coleman
✓W. C. Lewis
W. J. Martin
J. H. Mason
✓J. O. Pike
✓G. Shoaf
D. B. Suggs
I. Van Horn

PROBLEM STATEMENT OUTLINE

MODEL 5 TETHERED FLIGHT INSTALLATION IN MOFFETT FIELD HANGAR

I. Design and Procurement
(Responsibility - Model 5 Project Office)

Design and procurement of equipment necessary for accomplishing tethered flight tests.

II. Operating Technique
(Responsibility - Flight Test)

1. Develop a ground technique to measure the allowable deviations in the airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

2. Develop a landing technique for various loads and side wind conditions.

III. Airplane Hovering Characteristics
(Responsibility - Flight Test and Dynamics)

1. Autopilot not installed or not in operation.

   (a) Obtain information necessary to check the progress of the autopilot design.
   (b) Determine effects of side winds from all possible angles.

III. Airplane Hovering Characteristics (cont'd)

2. Autopilot installed.

(a) Check airplane response, with autopilot in operation, to determine optimum autopilot adjustment and information for autopilot design improvement.

IV. Landing Loads
(Responsibility - Flight Test and Dynamics)

Obtain acceleration and impact loadings during landing to correlate with the design analysis.

V. Stability and Control
(Responsibility - Flight Test and Aerodynamics) ✓

1. Investigate control effectiveness.

(a) Elevator, aileron, rudder.
(b) Determine in steady hover at various lateral, vertical and longitudinal c.g. locations.

2. Dynamic stability.

(a) With immediate attempted recovery.
(b) With delayed attempted recovery.

VI. Performance
(Responsibility - Flight Test and Aerodynamics) ✓

1. Acceleration vs. time at full takeoff power for 3 second period, if possible.

VII. Safety Items
(Responsibility - Flight Test and Aerodynamics) ✓

1. Simulate pitch-up in flight normal to centerline.

(a) Simulate with ballast in vertical tail.
(b) Simulate thrust-center of gravity eccentricity moment by shifting ballast.

2. Engine failure.

(a) Determine effect of failure of one power section on rate of descent.
(b) Determine effect of complete power failure on longitudinal control.

3. Investigate lateral hover translation and rate of descent within limits of tethered flight.

D.B. Suggs
D. B. Suggs

cc: R.L. Bayless
J.H. Famme
E.D. Shannon

CONVAIR - San Diego

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8 January 1953

R. C. Pederson

Contract NOas 51-936 - Model XFY-1 Airplanes
Tethered Flight Tests at Moffett Field

Reference (a) C. W. Power Memo to R. C. Pederson dated 18 December 1952

1. Until BuAer authorized the use of Moffett Field for subject tests, and until a survey by CVAC of the problems peculiar to that location could be accomplished, it is realized that no adequate cost estimate could be prepared for these tests. However, a tight situation has developed in regard to obtaining contractual coverage in sufficient time to permit advance work to be accomplished in preparation for the tests. This advance work must be started now in order to meet schedules.

2. In view of this urgency, it is requested that reference (a) be processed at the earliest possible date.

CWPower
C. W. Power
Navy Contracts Administration Supervisor

LHL:mmm

cc: D. H. Digges
C. B. Carroll
L. Moore
W. F. Brown
C. L. Meador
C. W. Power (2)
51-936 Chron

NOTE & RETURN TO

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1		[illegible]	1/23
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3	Hyme	[illegible]	1/19
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Serial #50-156-3

CONVAIR

Date: 2 March 1953

To: R. C. Pederson

Subject: Model 5 Tethered Flight Test at Moffett Field - Estimated Engineering, Experimental Flight And Experimental Factory Costs For

Reference: Memo C. W. Power to R. C. Pederson dated 18 December 1952

Enclosure: (A) Cost Proposal Outline Serial #50-156-3 as revised 2 March 1953

(B) Equipment List

1. The following is submitted for your information and use in the preparation of a Cost Proposal for the subject Test Program as described in Enclosure (A). Estimate is presented in breakdown form to facilitate compilation of total program costs by totalling the pertinent phase costs.

2. Estimated Engineering Costs

A. Delivery and Shipment of Airplane

Scheme A. (Via Truck)

Experimental Mfg. Labor	20,510 Manhours

Scheme B. (Via Navy Facilities)

Experimental Mfg. Labor	10,520 Manhours

NOTE: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department. Transportation costs to be supplied by Estimating Department.

B. Design of Test Installations, etc., as Described in Item 6.A.(2) of Enclosure A

Design, Draft and Technical Data	6,772 Manhours	
Materils & Direct Charges		$ 1,625
Experimental Tooling Labor	110 Manhours	
Experimental Mfg. Labor	4,355 "	

B. Cont'd

NOTE: The above costs are applicable to either of the alternate Security configurations.

NOTE: Estimates for Experimental Shop Manufacturing and Tooling Materials to be supplied by Materials Department.

NOTE: In the event that Experimental Factory fabrication of the Hoist Equipment Platform is to be considered, the following estimates are considered applicable for fabrication only.

Experimental Shop Mfg. Labor 8,500 Hrs.

Estimate for Experimental Shop Manufacturing Materials to be supplied by Materials Department.

Estimate for Erection of Platform to be supplied by Estimating Department.

C. Accomplishment of the Test Program as Described in Item 6.A.(3) of Enclosure A

Design, Draft, & Technical Data	65,558 Hrs	
Engineering Materials & Direct Charges		$ 36,085
Experimental Tooling Labor	1,800 Hrs	
Experimental Mfg. Labor	13,000 Hrs	
Experimental Maintenance & Repair Labor	40,075 Hrs	
Flight Test Flying Hours	50 Hrs	
Fuel (Gallons/Hr), 840		
Oil (Gallons/Hr), 20		
Per Diem Allowance	Man days- 10,533	

NOTE: In the above program (full), it is assumed that oscillographs will be available and AutoPilot installed in airplane at San Diego.

NOTE: Transportation costs to be supplied by Estimating Department.

D. Accomplishment of the Test Program as Described in Item 6.E.(3) in Enclosure A

Eng. Design, Draft & Tech. Data		32,625 Hrs.	
Eng. Materials & Direct Charges			$ 14,272
Experimental Tooling Labor		1,800 Hrs.	
Experimental Mfg. Labor		13,000 Hrs.	
Exp. Maintenance & Repair Labor		23,010 Hrs.	
Flight Test Flying Hours	25		
Fuel (Gallons/Hr)	840		
Oil (Gallons/Hr)	20		
Per Diem Allowance		Man days 5,724	

NOTE: Transportation costs to be supplied by Estimating Department

NOTE: Estimate for Spare Purchased Parts and materials for Maintenance and Repair of the Airplane during Flight Test are to be supplied by Materials Department.

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SECURITY INFORMATION

Serial No. 50-156-3

Date: 15 January 1953

Page 1

COST PROPOSAL OUTLINE

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

1. PROPOSAL REQUESTED/ORIGINATED BY: Model 5 Project Office (C. B. Carroll) Confidential Memo to L. Moore dated 23 December 1952

2. FOR SUBMITTAL TO: BuAer

3. DATE PROPOSAL IS TO BE SUBMITTED: To be determined by Contract Department.

4. TYPE OF BID DESIRED: Firm

5. TYPE OF CONTRACT CONTEMPLATED: Amendment to NOa(s) 51-936-C (CPFF)

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight. See Resume and Work Statement for Model 5 Restrained Hovering Flight Test Installation in Moffett Field Hanger - Report ZM-5-026.

Test Program as outlined in this Proposal may be modified and is to be estimated as, both the task as outlined, and as modified by the omission and/or minimizing of certain tasks indicated below; and on Page 1/a. (Major purchased items required)

A. Omit the following tasks (all Groups and/or Departments)

(a) Check Airplane response, with Autopilot in operation, etc. (ID2(a) page 2)

(b) Performance - Acceleration vs. time at full take-off, etc. (IE1 page 2a)

(c) Safety item - Simulate Pitch-up in Flight normal to centerline, etc. (IF1(a) (b) page 2a)

(d) Tests requiring the use of oscillographs other than those in the airplane.

B. Minimize the following task (All Groups and/or Departments)

(a) Safety Item - Engine Failure, Etc. (IF2(a) (b) page 2a.

(b) Operating Technique - (IA2) Page 2

Note: Autopilot testing at Moffett Field is contingent upon the receipt of Autopilot from Vendor in time to be installed in plane at San Diego before shipping Plane to Moffett Field. Cost of installation and testing of autopilot after plane has been shipped to Moffett Field shall be separately negotiated.

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7. DETAIL WORK STATEMENT

I. The following is an outline of Experimental Flight responsibilities for the total program.

A. Operating Technique

1. Develop a ground technique to measure the allowable deviations in the airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

2. Develop a landing technique for various loads and side wind conditions. (Side wind conditions omitted in Mod. Program)

B. Airplane Hovering Characteristics

1. Autopilot not installed or not in operation.

(a) Obtain information necessary to check the progress of the autopilot design.

(b) Determine effects of side winds from all possible angles.

2. Autopilot installed.

(a) Check airplane response, with autopilot in operation, to determine optimum autopilot adjustment and information for autopilot design improvement.

C. Landing Loads

Obtain acceleration and impact loadings during landing to correlate with the design analysis.

D. Stability and Control

1. Investigate control effectiveness.

(a) Elevator, aileron, rudder.

(b) Determine in steady hover at various lateral, vertical and longitudinal c.g. locations.

2. Dynamic stability.

(a) With immediate attempted recovery.

(b) With delayed attempted recovery.

7. DETAIL WORK STATEMENT (Cont'd

E. Performance

1. Acceleration vs. time at full takeoff power for 3 second period, if possible.

F. Safety Items

1. Simulate pitch-up in flight normal to centerline.

   (a) Simulate with ballast in vertical tail.

   (b) Simulate thrust center of gravity eccentricity moment by shifting ballast.

2. Engine failure ~~[illegible]~~ **(in the modified program this test would be limited to qualitative data only)**

   (a) Determine effect of failure of one power section on rate of descent.

   (b) Determine effect of complete power failure on longitudinal control.

translation
3. Investigate lateral transition and rate of descent within limits of tethered flight.

7. DETAILED WORK STATEMENT (Cont'd)

II. Description of the aerodynamics work involved in this program is as follows:

A. Investigated tares associated with design of tethering system, compute necessary corrections to measured data due to tethering system, provide liaison on aerodynamic loads imposed on tethering system, hangar and test equipment.

B. Make preliminary investigations of critical stability and control characteristics in hovering flight, obtain information regarding ranges of safe hovering flight and limiting airplane loading conditions for hovering.

C. Determine critical take-off and landing performance characteristics to insure adequate take-off accelerations are available for selected loading conditions and that suitable control of descent rate can be maintained.

D. Conduct a brief investigation of slipstream characteristics to investigate flow characteristics in the cockpit area and in the vicinity of the control surfaces.

7. DETAILED WORK STATEMENT (Cont'd)

III Description of the Dynamics Work involved in this program is as follows:

A. Operating technique

1. Develop a technique for landing in the presence of side winds from all angles.

2. Develop a ground technique to measure allowable deviations in airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

B. Airplane Hovering Characteristics

1. Without autopilot

a) Determine airplane dynamic response in the presence of side winds from all angles.

2. With autopilot

a) Determine airplane dynamic response in the presence of side winds from all angles.

b) Determine optimum adjustments for autopilot

C. Loads

1. Determine landing loads minimum program and accelerations in the presence of side winds from all angles.

2. Determine shock strut responses

3. Determine loads in tethering cables

4. Determine rate of descent

D. Safety Items

1. Simulate initiation of transition and determine dynamic response.

2. Determine airplane dynamic response with power failure

E. Vibration

1. Investigation of Vibration Problems

7. DETAILED WORK STATEMENT (Cont'd)

Note: The following items, which may become of a major nature, are not to be included in this proposal but are to be quoted separately after the requirements have been determined.

a) Dynamic investigations and corrective actions required as a result of captive flight testing.

b) Additional captive flight testing as desired by the Customer or recommended by the Contractor.

c) Modifications to the autopilot as a result of captive flight testing.

7. DETAILED WORK STATEMENT (Continued)

IV. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to Hoist and controls to accomplish Tethered or Captive condition.

B. Supply mechanics and electricians to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply spare parts, fittings, tools and equipment to maintain a "Shop" at Moffett Field.

D. Maintain, service and repair Tethering equipment during test program.

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department will be required to handle this task.

F. Pilot's Escape provisions as described in Report ZM-5-026 requires hooks to be installed on the windshield structure above the Pilot's seat. This part to be the responsibility of Experimental Department.

G. Proof Loading Test of Hanger and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hanger structure and Hoist during the tethered flight test. Engineering Test Laboratory and Instrumentation Group will render their services for this test also.

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practice. Two (2) full time inspectors will be required at Moffett Field for this purpose.

H. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus securing an erector.

7. DETAILED WORK STATEMENT (Cont'd)

V. The Dynamics Group of the Engineering Test Laboratories will perform the following functions in connection with the execution of the Model 5 Captive Flight Test Program:

1. Engineer methods and means for obtaining any and all dynamic data desired.

2. Engineer calibration means and procedures; also auxiliary equipment as required.

3. Calibrate all dynamic pickups and associated amplifiers and recording equipment.

4. Take dynamic test data throughout the test program. Edit test data and provide preliminary data reduction.

5. Provide engineering liaison with Experimental Flight, other Engineering groups and Instrumentation.

The foregoing dynamic test procedures will be applied specifically to the following scheduled tests:

a ~~1.~~ Flight operational techniques.

b ~~2.~~ Airplane characteristics with and without Auto Pilot.

(c) ~~3.~~ Landing loads.

(d) ~~4.~~ Control effectiveness investigation.

(e) ~~5.~~ Dynamics stability and damping tests.

(f) 6. Special configuration tests.

(g) ~~7.~~ Engine failure tests.

6. STATIC TEST OF FACILITY AT MOFFETT FIELD. THIS TASK WILL BE TO SUPPLY A DEAD WEIGHT FIXTURE CAPABLE OF CONTAINING 48000 POUNDS (INCLUDING FIXTURE WEIGHT) AND HAVING A TARE WEIGHT THAT CAN BE TRIMMED TO 13,000 POUNDS, WATER TO BE USED AS BALLAST. PROOF LOAD TO BE APPLIED AS FOLLOWS:

(a). THE EMPTY TANK WILL BE RAISED A SHORT DISTANCE ABOVE FLOOR BY MEANS OF THE TETHERED GEAR.

(b) WATER WILL BE ADDED IN INCREMENTS OF 4800.0 POUND PROOF LOAD AND DEFLECTION OF THE HANGER WILL BE MEASURED FOR EACH INCREMENT OF LOAD.

VI Engineering Design task is as follows:

A. Proposal and General Study

B. Hoist and Tethering Controls Installation

- (a) Hoisting Mechanism
- (b) Counter Balance Mechanism
- (c) Automatic Control Equipment
- (d) Reels and Brake
- (e) Cable Assemblies
- (f) Pneumatic Snubber for Nose Cable
- (g) Pulleys, Idlers and Mounting
- (h) Tethering Line Installation

C. Hoisting Beam Installation

- (a) Beam Structure
- (b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation

- (a) Curtains at Arch 3, Doors and Corridor
    - (1) Curtain Catenary and Support Cables
    - (2) Curtain Reinforcement and Support Fittings
    - (3) Curtain Support Beam and Mast Rework
- (b) Cyclone Fence Installation
    - (1) At Arch 3
    - (2) At corridor
    - (3) At doors

E. Pilot's Escape Provisions Installation

(a) Friction Clutch and Reel

(b) Harness, Cable and Attachments

F. Airplane Modifications

(a) Cable Attachment at Nose

(b) Tethering Line Attachment

(c) Installation of Tethering and Brake Controls

(d) Plane to Ground Communications

G. Procurement, Release and Check

H. Installation Liaison

(a) Mechanical

(b) Electrical

7. DETAILED WORK STATEMENT (Cont'd)

VII. Instrumentation task concerning subject test will be as follows:

A. Tail Surface Temperature Survey

1. To be accomplished at San Diego

a. Fabricate and install 16 thermocouples on tail fins.

2. To be accomplished at Moffett Field

a. Terminate thermocouples, extend all cables and wires to a remote Brown Temperature Recorder.

B. Slipstream Velocity Survey

1. To be accomplished at San Diego

a. Fabricate three pressure rakes of ten pickups each.

b. Provide 50 tube manometer board - 60" H_2O.

2. To be accomplished at Moffett Field

a. Mount rakes at various positions on fins.

b. Route flexible tubing from rakes to remote manometer board.

C. Landing Loads

1. To be accomplished at San Diego

a. Provide brackets for 12 accelerometers.

b. Provide mounting racks for oscillograph equipment.

2. To be accomplished at Moffett Field

a. Provide mounts for the accelerometers on landing struts.

b. Install 20 strain gauges on landing struts.

c. Route cables for strain gauges and accelerometers, terminate to ground oscillographic equipment.

d. Set up oscillograph equipment and provide wiring for power supplies, i.e., batteries, inverters, etc.

7. DETAILED WORK STATEMENT (Cont'd)

VII.

D. Telemetering to be used for Ground Tests

1. To be accomplished at Moffett Field

a. Plug in to existing flight instrumentation transmitters on ship and route coaxial signal cable from the ship to remote receiving station.

b. Set up receiving station with necessary interconnecting cables and power supplies.

E. Calibrations

1. To be accomplished at San Diego and Moffett Field

a. Provide test groups with calibrations of all instruments concerned before and during test program.

F. Photographic Services

1. To be accomplished at Moffett Field.

a. Provide personnel and equipment for processing pertinent microfilm and oscillograph tape.

G. Proof Loading Test

a. Provide Equipment as required.
See Page 6, Paragraph G.

Note: It is assumed at this time that the majority of instruments and related special equipment will be GFE.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

1. North end of Hanger to Arch #3 except Shop area along West side.
2. Four (4) Mooring Masts
3. 8 Foot "Cyclone" wire fence (approx. 170 Ft.)
4. 3 -30 Ft. Sections and 2 - 24 Ft. Sections of movable fence to be used as gates.
5. Monorail Cars and operators (4) to assist subcontractor and Convair in setting up Tethered Flight Test equipment.
6. One Monorail Car to stand by during actual "Flight" of Captive Plane, with Pilot Escape equipment installed to Car.
7. Partitioned Office at East Side of Hanger between Arch #2 and #3.
8. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.
9. U. S. Marine Corps Guard for Security during entire Test Program.
10. Electric Power
11. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)
12. Photo Lab. Facilities
13. Fire fighting equipment adequate for all possible emergencies during this type of test program.
14. First Aid and Emergency Hospital Facilities.

IX. Personnel (Convair) Accommodations and Facilities at Moffett Field.

1. Transportation Requirements will be provided by Convair. These will have to be rented.
2. Personnel assigned to Moffett Field will be on a per diem basis. Quarters will have to be arranged for at either San Jose or Palo Alto.

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel fabrication and erection
(b) Motor driven hoist assembly and installation
(c) Fabric (canvas) curtain manufacture and installation

11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's Pre-Flight Evaluation Tests.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Alternate schemes for delivery and shipment of subject airplane are to be considered:

Scheme A.

Model 5, Ship Number One shall be disassembled at Convair Plant, San Diego; crated and shipped to Moffett Field by truck. Plane to be reassembled for tests. After tests are completed, plane shall be disassembled, crated, and returned to Convair where it will be reassembled. This task to be accomplished by Experimental Department. Experimental Department task does not include shipping.

Scheme B.

Model 5, Ship Number One, completely assembled except for propeller, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls
2. Hoist Beam Structure
3. Canvas Curtains and Supporting Cables. (See Rev. Drwg. 5-0210$_4$) Curtain enclosures for entire Test Area and enclosure for plane. To be priced separately.
4. (a) 250 Feet of Cyclon Fencing. This purchased fencing plus fencing supplied by Navy at Moffett Field to be installed and priced as one contract.

   (b) Alternate arrangement will require using only fencing supplied by Navy at Moffett Field. To be priced installed.

5. Pilot's Escape Provisions - See Report ZM-5-026, Page 20. (Modification of Plane by Experimental Dept.)
6. ~~Nose-Cable-Snubber.~~ Snubbing Cylinders (2)
7. Counter Balance Cable Snubber.
8. Tail Cable Snubber.
9. ~~Platform~~ (See Rev. Drawing 5-0210$_4$) no platform required. In lieu of platform a 1/4" steel plate 12 feet square (one piece) shall be placed directly on existing concrete floor. Thermal insulation to be installed between steel plate and concrete floor.

Note: The above items will be manufactured and installed by Sub-Contractors by Personnel approved under Security Regulations. Sub-Contractors will be required to make available their representative at such times as believed necessary by Convair Test Supervisor. All installations ~~will~~ may be removed after test program is completed ~~by Vendor.~~ At customer's option, test installations may be left in place for future use. To be priced each way.

14. CAPITAL FACILITIES REQUIRED:

Requirements are to be determined and separate list submitted.

15. PROPOSED PROGRAM SCHEDULE:

A. Engineering Final Release 1 June 1953

B. Tooling and Manufacture Completion 1 August 1953

C. Flight Program Completion - Establishment of a Flight Program Schedule is dependent upon new engine delivery date presently being established.

16. APPLICABLE SPECIFICATIONS OR DESCRIPTIVE DATA AVAILABLE FOR ESTIMATING PURPOSES:

1. Drwg. 5-02104 "Proposal - XFY-1 Tethered Flight"
2. "Moffett Field Trip Report" dated 29 November 1952
3. "Problem Statement Outline" dated 23 December 1952
4. "Resume and Work Statement" Report ZM-5-026
5. Cost Proposal Outline Serial No. 50-156-3 dated 15 Jan. 1953

17. ENGINEERING COORDINATOR ASSIGNED: D. B. Suggs PHONE NO. W-6611
Ext. 1766

18. SCHEDULE FOR DEPARTMENTAL COST ESTIMATES AND DATA TO BE SUBMITTED TO CONTRACTS DEPARTMENT (to be supplied by Contracts Department or arrived at in proposal meeting)

Prepared by:
ENGINEERING PLANNING AND ESTIMATING

LM:DKF:vj

CONFIDENTIAL

DATE: 2 MARCH 1953 SERIAL #50-156-3

TO: R.C. PEDERSON

SUBJECT MODEL S TETHERED FLIGHT TEST AT MOFFETT FIELD – ESTIMATED ENGINEERING, EXPERIMENTAL FLIGHT AND EXPERIMENTAL FACTORY COSTS FOR

REFERENCE: MEMO. C.W. POWER TO R.C. PEDERSON DATED 18 DECEMBER 1952.

ENCLOSURE: (A) COST PROPOSAL OUTLINE SERIAL #50-156-3 AS REVISED 2 MARCH 1953.
(B) EQUIPMENT LIST.

1. THE FOLLOWING IS SUBMITTED FOR YOUR INFORMATION AND USE IN THE PREPARATION OF A COST PROPOSAL FOR THE SUBJECT TEST PROGRAM AS DESCRIBED IN ENCLOSURE (A). ESTIMATE IS PRESENTED IN BREAKDOWN FORM TO FACILITATE COMPILATION OF TOTAL PROGRAM COSTS BY TOTALING THE PERTINENT PHASE COSTS.

2. ESTIMATED ENGINEERING COSTS.

A. DELIVERY AND SHIPMENT OF AIRPLANE.

SCHEME A (VIA TRUCK)

EXPERIMENTAL MFG. LABOR, 20510 MANHOURS @ $4.24 $86962

SCHEME B (VIA NAVY FACILITIES)

EXPERIMENTAL MFG. LABOR, 10520 MANHOURS @ $4.24 $44605

NOTE: ESTIMATES FOR EXPERIMENTAL SHOP MFG. AND TOOLING MATERIALS TO BE SUPPLIED BY MATERIALS DEPT. TRANSPORTATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

B. DESIGN OF TEST INSTALLATIONS ETC, AS DESCRIBED IN ITEM 6 A(2) OF ENCLOSURE A

DESIGN, DRAFT & TECH DATA, 6772 MANHOURS @ $5.01 $33928

MAT'LS & DIRECT CHG'S. $1625

EXPERIMENTAL TOOLING LABOR, 110 MANHOURS @ $4.24 $466

EXPERIMENTAL MFG. LABOR, 4355 MANHOURS @ $4.24 $18465

NOTE: THE ABOVE COSTS ARE APPLICABLE TO EITHER OF THE ALTERNATE SECURITY CONFIGURATIONS.

NOTE: ESTIMATES FOR EXPERIMENTAL SHOP MFG. AND TOOLING MATERIALS TO BE SUPPLIED BY MATERIALS DEPT.

INSERT A

C. ACCOMPLISHMENT OF THE TEST PROGRAM AS DESCRIBED IN ITEM 6 A(3) OF ENCLOSURE A

DESIGN, DRAFT., & TECH DATA	65558	MANHOURS	@ $5.01	$328445
✓ ENG. MATLS & DIRECT CHGS.				$36085
EXPERIMENTAL TOOLING LABOR	1800	MANHOURS	@ $4.24	$7632
EXPERIMENTAL MFG. LABOR	1300	MANHOURS	@ $4.24	$65120
EXPERIMENTAL MAINT & REPAIR LABOR	40075	MANHOURS	@ $4.24	$169918
FLIGHT TEST FLYING HOURS	50			
FUEL (GALLONS/HR)	840			
OIL (GALLONS/HR)	20			
PER DIEM ALLOWANCE	10533	MAN DAYS	@ 9.00	$94797

NOTE: IN THE ABOVE PROGRAM (FULL) IT IS ASSUMED THAT OSCILLOGRAPHS WILL BE AVAILABLE AND AUTO PILOT INSTALLED IN AIRPLANE AT SAN DIEGO.

NOTE: TRANSPORTATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

A

NOTE: IN THE EVENT THAT EXPERIMENTAL FACTORY FABRICATION OF THE HOIST EQUIPMENT PLATFORM IS TO BE CONSIDERED THE FOLLOWING ESTIMATES ARE CONSIDERED APPLICABLE FOR FABRICATION ONLY.

DBL SPACE → EXPERIMENTAL SHOP MFG. LABOR 8500 @ $4.24 $36040

ESTIMATE FOR EXPERIMENTAL SHOP MFG. MATERIALS TO BE SUPPLIED BY

A SPACE → MATERIALS DEPT.

: ESTIMATE FOR ERECTION OF PLATFORM TO BE SUPPLIED BY ESTIMATING DEPT.

D. ACCOMPLISHMENT OF THE TEST PROGRAM AS DISCRIBED IN ITEM 6 E (3) IN ENCLOSURE A

ENG. DESIGN, DRAFT & TECH. DATA	32625	MANHOURS	@ $5.01	$163451
ENG. MATLS & DIRECT CHGS.				$14272
EXPERIMENTAL TOOLING LABOR	1800	MANHOURS	@ $4.24	$7632
EXPERIMENTAL MFG. LABOR	13000	MANHOURS	@ $4.24	$65120
EXPERIMENTAL MAINT. & REPAIR LABOR	23010	MANHOURS	@ $4.24	$97562
FLIGHT TEST FLYING HOURS	25			
FUEL (GALLONS/HR)	840			
OIL (GALLONS/HR)	20			
PER DIEM ALLOWANCE	5724	MANDAYS	@ 9.00	$51516

NOTE: TRANSPORTATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

NOTE: ESTIMATE FOR SPARE PURCHASED PARTS AND MATERIALS FOR MAINTENANCE AND REPAIR OF THE AIRPLANE DURING FLIGHT TEST ARE TO BE SUPPLIED BY MATERIALS DEPARTMENT.

Field/Bailey
Jimmie/O. Beall
L. Moore (2)
Engr File

MODEL XFY 1 — MODEL 5 TETHERED FLIGHT TEST (MOFFETT FIELD)

PROPOSAL SERIAL No. 50-156-3
DATE ______ PAGE No. 15

	FULL					
	SAN DIEGO FULL	SAN DIEGO MOD	MOFFETT FIELD FULL	MOFFETT FIELD MOD	MAN DAYS / DIEM FULL	MOD.
✓ PRELIMINARY DESIGN	6772	6772				
~~WING~~ ENG. COORD.			4800	3000	720	450
TAIL						
HULL, FLOATS, FUSELAGE						
ARMAMENT						
LAND'G GEAR & MECHANISMS						
FURNISHINGS						
CONTROLS						
POWER PLANT						
ETL MAT'LS — HYDRAULICS, PNEUMATICS	$850	$850	$11500	$6000		
INST. MAT'LS — HEATING, VENTILATING, PRESS.	$1200	1300	$6800	$2300		
ELECTRICAL						
INSTRUMENTS						
ELECTRONICS						
SUB-TOTAL MAN HOURS	6772	6772	4800	3000	720	450
✓ STRUCTURES-STRESS	1458	1458				
WEIGHTS						
✓ CHECKING	100	100				
LINES						
LOFTING						
ISOMETRICS						
✓ AERODYNAMICS	8100	6480	1065	852	118	94
✓ DYNAMICS	8600	600	1600	600	240	90
HYDRODYNAMICS						
THERMODYNAMICS						
✓ PROPULSION LAB (RAMP)			300	300	45	45
ELECTRONICS LAB						
✓ ENG. TEST LAB	1240	1040	4900	1300	725	185
✓ INSTRUMENTATION	2450	2450	11600	2400	1440	720
SPEC. & SERVICE PUB.						
AIRCRAFT SERVICE						
OPERATIONAL ANALYSIS						
✓ LIAISON			5500	3700	825	555
SUB-TOTAL MAN HOURS	21948	12128	24965	9152	3393	1689
TOTAL ENG. MAN-HOURS	28720	18900	29765	12152	4113	2139
ENG. MAT. & DIR. CHARGES	$8943	$6686	$25443	$11216		
** EXP. FACTORY MAN HOURS	15360	15360	62780	45715	5250	3000
~~EXP. FACTORY MATERIAL~~						
EXP. TOOLING MAN HOURS	110	110				
~~EXP. TOOLING MATERIAL~~						
~~W/T HOURS OF OPERATION~~						
~~W/T MAN HOURS (DEPT. 61)~~						
FLIGHT TEST FLYING HOURS			50	25		
* DATA ANALYSIS & COORD.	6290	4570	7555	3775	1170	585
FUEL (GALLONS/HR.)			840	840		
OIL (GALLONS/HR.)			20	20		

NOTE: ALL DESIGN FUNCTIONS ARE COMBINED IN ONE SPECIAL DESIGN GROUP - WORK TO BE ACCOMPLISHED UNDER AWO #9195 AND E.W.O # 1410.

INCLUDED IN TOTAL

VOID

* INCLUDES PILOTS STANDBY TIME.
** HRS. INDICATED ARE BASED ON SHIPPING PLANE VIA NAVY FACILITIES. ADD

PREPARED BY—
ENG. PLANNING & ESTIMATING

359T-14LG KEUFFEL & ESSER CO.

CONFIDENTIAL

Serial # 50-156-3

DATE: (19) FEBRUARY 1953

TO: R.C. PEDERSON

SUBJECT: MODEL 5 TETHERED FLIGHT TEST AT MOFFETT FIELD - Cost Proposal for

REFERENCE: Memo C.W. POWER TO R.C. PEDERSON DATED 18 DECEMBER 1952

ENCLOSURE (A) COST PROPOSAL OUTLINE SERIAL # 50-156-3 AS REVISED (19) FEBRUARY 1953.

(B) EQUIPMENT LIST

1. THE FOLLOWING IS SUBMITTED FOR YOUR INFORMATION AND USE IN THE PREPARATION OF a COST~~S~~ proposal FOR THE SUBJECT TEST PROGRAM AS DESCRIBED IN ENCLOSURE (A). ~~ESTIMATE~~ IS PRESENTED IN BREAKDOWN FORM TO FACILITATE COMPILATION OF TOTAL PROGRAM COSTS BY TOTALING THE PERTINENT PHASE COSTS.

2. ESTIMATED ENGINEERING COSTS.

A. ALTERNATE SECURITY PROVISIONS

ENGINEERING COSTS NOT AFFECTED. BOTH ALTERNATES TO BE DESIGNED AND SPECIFIED BY DESIGN GROUP. ENGINEERING ESTIMATE INCLUDED IN BOTH MODIFIED & FULL PROGRAM.

B. ALTERNATES FOR DELIVERY AND SHIPPING AIRPLANE TO MOFFETT FIELD

SCHEME A (VIA TRUCK)

EXPERIMENTAL SHOP MFG. LABOR (20510 MAN HOURS)

SCHEME B (VIA NAVY FACILITIES)

EXPERIMENTAL SHOP LABOR (10520 MAN HOURS)

NOTE: ESTIMATE FOR EXPERIMENTAL SHOP MFG. AND TOOLING MATERIALS TO BE SUPPLIED BY MATERIALS DEPT. TRANSPORTATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

NOTE

C. HOIST EQUIPMENT PLATFORM - FABRICATION ONLY

EXPERIMENTAL SHOP MFG. LABOR	8500 MANHOURS

NOTE: ESTIMATE FOR EXPERIMENTAL SHOP MFG. MATLS TO BE SUPPLIED BY MATERIALS DEPT.

NOTE: ESTIMATE FOR ERECTION OF PLATFORM TO BE SUPPLIED BY ESTIMATING DEPT.

D. FULL TEST PROGRAM (6 MONTHS OF FLIGHT TESTING)

ENGINEERING DESIGN; DRAFTING & TECH. DATA.	72 190 M/HRS.
ENGINEERING MAT'LS. & DIRECT CHARGES	$ 30 910
EXPERIMENTAL SHOP TOOLING LABOR	110 MANHOURS
EXPERIMENTAL SHOP MFG. LABOR	5245 MANHOURS
EXPERIMENTAL SHOP MAINTENANCE & REPAIR LABOR	53 875 MANHOURS
FLIGHT TEST FLYING HOURS	50
FUEL (GALLONS/HR)	840
OIL (GALLONS/HR)	20

PER DIEM ALLOWANCE - 10 528 MAN DAYS

NOTE: TRANSPORTATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

NOTE: IN THE FULL (6 MONTHS) PROGRAM IT IS ASSUMMED THAT OSCILLOGRAPHS WILL BE AVAILABLE AND AUTO PILOT INSTALLED IN AIR PLANE.

E. MODIFIED TEST PROGRAM (3 MONTHS OF FLIGHT TESTING)

ENGINEERING DESIGN, DRAFTING & TECH. DATA	39 257 M/HRS
ENGINEERING MAT'LS. & DIRECT CHARGES	$ 16 935
EXPERIMENTAL SHOP TOOLING LABOR	110 MANHOURS
EXPERIMENTAL SHOP MFG. LABOR	5245 MANHOURS
EXPERIMENTAL SHOP MAINTENANCE & REPAIR LABOR	36700 MANHOURS
FLIGHT TEST FLYING HOURS	25
FUEL (GALLONS/HR)	840
OIL (GALLONS/HR)	20

PER DIEM ALLOWANCE - 5719 MAN DAYS

NOTE: TRANSPORATION COSTS TO BE SUPPLIED BY ESTIMATING DEPT.

NOTE: IN THE MODIFIED (3 MONTHS) PROGRAM IT IS ASSUMMED THAT OSCILLOGRAPHS WILL NOT BE AVAILABLE AND AUTO PILOT NOT INSTALLED IN AIRPLANE.

NOTE: ESTIMATES FOR SPARE PURCHASED PARTS AND MATERIALS FOR MAINTENANCE OF THE AIRPLANE DURING FLIGHT TESTING ARE TO BE SUPPLIED BY MATERIALS DEPARTMENT.

CONVAIR

3 February 1953

Mr. O. C. Banke

Basic Tools and equipment needed at Moffit Field to set up a shop for maintenance of the XFY-1 during test operations.

EXPERIMENTAL DEPT.

		Quan.	Weight
Foreman's Desk 34" x 60" x 32"	$ 30.00	1	100
Parts Crib 20' x 40' x 8' High	360.00	1	2000
Parts Cabinets 24" x 48" x 72"	300.00	5	1500
Shelves 24 x 144 x 72"	180.00	3	1200
AN parts Bins 12" x 144 x 72"	125.00	1	200
Work Benches & Vises 12 ft. 3' x 4' x 12'	1200.00	8	1200
* Rivet Guns $85.00	340.00	4	40
* Air Hose	100.00	500 Ft.	125
* 100 Ft. ext. cords	72.00	6	150
* Safety Drop Lights 25 ft. cords	120.00	12	50
* Air Motors 1/4 $70.00	700.00	10	50
* Air Motors 1/2	135.00	1	50
Drill Press 28 x 34 x 16	220.00	1	200
Band Saw 30 x 70 x 24	200.00	1	150
* Padlocks	12.00	12	5
File Cabinets (Equipped for locking) 20 x 30 x 54	130.00	2	150
"A" Frames (Sheet Metal) 3' x 6' x 12'	150.00	1	250
Misc. AN parts 24" x 48" x 54"	100.00		200
Assorted Sheet Stock 1' x 4' x 8'	200.00		400
Tube Bender 30" x 48" x 120"	500.00	1	300
Small Tube Flare Machine 28" x 28" x 28"	500.00	1	100
* Grease Guns (Zerk)	25.00	2	10
Bench Grinder 14" x 14" x 24"	50.00	1	40
* Huck Gun (Rivet) Gun sets	56.00		
	16.00	1	10
* Cherry Gun (Rivet) J-15-RB	202.00	1	5
Bench Brake 18" x 12" x 60"	100.00	1	100
Unishear 12" x 12" x 15"	50.00	1	200
Vacuum Cleaner 1' x 1' x 3'	100.00	1	40
Steel Cabinet for solvents and grease storage 2' x 4' x 6'	30.00	1	75
TOTALS	$6303.00		8865 lbs

Costs and weights are approximate, also, a contingency of approximately 1000# should be allowed for crating, etc.

OMIT

This equipment list does not include any of the equipment listed under special tools released from Engineering dated 22 January 1953.

* Tub Fittings - Elec. supplies - Rivets	$ 500.00	300 #
GRAND TOTAL	6803.00	9165 #

* Three (3) wood boxes 2 1/2 x 4' x 3' will hold items as marked at approximately 280 pounds per box.

J. N. McPheeters, General Foreman
Experimental Department, 31

543A

CONVAIR

INTRA - COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 2 February 1953

TO Dave Faulk, Engineering Planning & Scheduling

SUBJECT Model 5 Captive Flight Test at Moffet Field

Per your request, listed below is our estimate of equipment necessary to maintain a lab at Moffet Field and to be shipped from San Diego:

INSTRUMENTATION GROUP.

1.	1 cabinet 3' x 8' x 12'	200 lbs
2.	1 film dryer 4' x 3' x 6'	250 "
3.	1 band saw 5' x 2' x 2'	300 "
4.	1 drill press 6' x 2' x 2'	275 "
5.	9 tool boxes	1,500 "
6.	1 welding bench and portable equipment 4' x 3' x 3'	500 "
7.	1 dark room - for photographic development, disassembled 5 pc plywood 8' x 4' x 1'	200 "
8.	Oscillograph mounting racks 3' x 3' x 12'	150 "
9.	4 boxes spare parts 3' x 5' x 3' - 200# ea.	800 "
10.	4 work benches 6' x 3' x 42"	500 "
11	Telemetering receiving equipment 5'8" x 7'2" x 22"	1,955 "
12.	1 Brown temp. recorder 16" x 20" x 24"	75 "

Not included in this memo is the oscillograph requirement. This list will be submitted by M. C. Brady of Engineering Test Labs.

Tyrus R. King
T. R. King, Foreman
Instrumentation Group

Approved:
R. B. Thompson, General Foreman
Instrumentation Group

TRK/ph
cc: R. A. Ackley
M. C. Brady
R. B. Thompson
L. Walton, Jr.
T. R. King
File

SERIAL NO. CPO 50-156-3
DATE 20 FEBRUARY 1953

EQUIPMENT LIST

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

THE FOLLOWING LIST OF EQUIPMENT AND BASIC TOOLS WILL BE REQUIRED AT MOFFETT FIELD. SUCH EQUIPMENT AND OR TOOLS THAT MAY BE MADE AVAILABLE BY CUSTUMER FOR CONVAIR PERSONNEL USE AT MOFFETT FIELD, WOULD DELETE THOSE ITEMS FROM THIS LIST. CONVAIR TO BE NOTIFIED OF AVAILABLE EQUIPMENT TO AVOID DUPLICATION AND UN NECESSARY SHIPPING COSTS.

ENGINEERING DEPT.

	QUANTITY	WEIGHT
OFFICE DESKS 34"×60"×32"	3	150# EA.
OFFICE CHAIRS	7	20# EA.
OFFICE TABLES 34"×60"×32"	4	100# EA.
DRAFTING TABLE - 7 FOOT	1	200#
DRAFTING MACHINE		5#
DRAFTSMAN STOOLS	4	10# EA.
BOX OF SUPPLIES 36"×36"×36"	1	100#

ENGINEERING TEST LAB.

BOX OF INSTRUMENTS 36"×36"×36"	4	100# EA.
" " 24"×36"×36"	1	100#
" " 36"×36"×48"	1	200#
" " 48"×36"×36"	1	500#
" CABLES 36"×36"×36"	1	400#
" MISC. SUPPLIES 36"×36"×48"	1	300#

NOTE: IN ADDITION TO THE ABOVE, THE FOLLOWING FACILITIES ARE REQUIRED AT MOFFETT FIELD.

1. METAL (TUBULAR STEEL) ACCESS LADDER.
2. STANDS – METAL WORK PLATFORMS.

ITEMS 1 AND 2 ABOVE ARE NAVY EQUIPMENT TO BE MADE AVAILABE FOR TEST PROGRAM (CPO SERIAL # 52-20)

SC BEL

3. MODEL 5 HANDLING TRUCK.

THIS ITEM IS NAVY EQUIPMENT INCLUDED IN ORIGINAL CONTRACT AND TO BE MADE AVAILABLE FOR TEST PROGRAM.

4. 2 - RECORDING 18 CHANNEL OSCILLOGRAPHS COMPLETE WITH 32 CHANNELS OF CARRIER AMPLIFIER AND ASSOCIATED EQUIPMENT. APPROXIMATE COST $ 25,000 EACH.

THIS ITEM IF MADE AVAILABLE, FROM NAVY FACILITIES EQUIPMENT LIST WOULD DELETE ABOVE COST. IF THE ABOVE OSCILLOGRAPHS ARE NOT AVAILABLE FROM NAVY FACILITIES THEY MAY BE PURCHASED FROM CONSOLIDATED ENGINEERING CORP. PROCURRMENT ARRANGEMENTS SHOULD BE MADE AT THE EARLIEST POSSIBLE DATE TO ASSURE THEIR AVAILABILITY ~~BY 15 SEPT. 1953 OR~~ 30 DAYS PRIOR TO FLIGHT TEST AT MOFFETT FIELD.

FULL PROGRAM

RANGE ESTIMATE DATA

[illegible] 1958

28680	M/HRS @ SAN DIEGO	
29665	" @ MOFFETT	
58345	M/HRS TOTAL ENG. M/HRS @ $5.01 =	$ 292,308
* 78 250	M/HRS TOTAL EXPERIMENTAL @ 4.24 =	331,780
13 845	M/HRS TOTAL FLIGHT (DATA ANALYSIS) @ 5.01 =	69,363
50	FLIGHT HOURS. @ 12.98	649
5 278	M/DAYS @ PER DIEM 9.00	47,502
		$ 741,602
	ETL & INST. MAT.	19,500
		761102
	MAT. & DIRECT CHG. (ENG.)	11410
		$ 772,512
	est. mat'l etc.	250
		1,025,652

MODIFIED PROGRAM

18860	M/HRS @ SANDIEGO	
12052	" @ MOFFETT	
30912	M/HRS TOTAL ENG. M/HRS @ 5.01 =	$ 154,869
* 61 075	M/HRS TOTAL EXPERIMENTAL @ 4.24 =	258,958
8 345	M/HRS TOTAL FLIGHT (DATA ANALYSIS) @ 5.01 =	41,808
25	FLIGHT HOURS @ 12.98	325
2719	M/DAYS @ PER DIEM 9.00	24,471
		480,431
	ETL & INST. MAT.	9,600
		490031
	MAT. & DIRECT CHG. (ENG.)	7335
		497366
		250

3/6 DH

* PLANE SHIPPED BY NAVY FACILITIES – ADD 9990 M/HRS OR $60,357 VIA TRUCK

FULL PROGRAM – (ENGINEERING)
ACCOMPLISHMENT o TEST ETC.

C.

28720✓ TOTAL ENG. M/HRS (SD)
6290✓ TOTAL DATA M/HRS. (SD)
35010
− 6772 DESIGN OF TEST INSTL.
28238
29765✓ TOTAL ENG M/HRS. (MOFFETT)
7555✓ " DATA " "
65,558 M/HRS — $15735
850
1200
11500
6800
ETL $ INST.
$36085

MOD PROGRAM
ACCOMPLISHMENT OF TEST ETC.

D.

18900 TOTAL ENG. M/HRS (SD)
4570 TOTAL DATA " (SD)
12152 TOTAL ENG. M/HRS MOFFETT
3775 " DATA " MOFFETT
39397
− 6772 DESIGN OF TEST INSTL.
32625 M/HRS — $3822
850
1300
6000
2300
ETL $ INST.
$14272

FULL PROGRAM: (EXPERIMENTAL)

C.

	15 360	EXP. FACTORY M/HR (SD)
	110	EXP. TOOLING (SD)
	62,780	EXP. FACTORY (MOFFETT)
	78250	
−	10,520 ✓	SHIP BY NAVY FACILITIES
	67730	
* −	1,800 ✓	EXP. TOOLING.
	65930	
−	8500 ✓	EXP. FAB. OF PLATFORM
	57430	
	4,355 ✓	MOD. AIRPLANE
	53075	
*	13 000	EXP. MFG. LABOR
*	40 075 ✓	EXP. MAINT. & REPAIR.

* ACCOMPLISHMENT OF PROGRAM — OTHER AMOUNTS AS INDICATED.

MODIFIED PROGRAM (EXPERIMENTAL)

D.

15360	EXP. FACT.	S.D.
110	" TOOLING	S.D.
45715	" FACT.	MOFFETT
61185		
10520	SHIP BY NAVY FACILITIES	
50665		
1800	EXP. TOOLING	
48865		
8500	EXP. FAB. OF PLATFORM	
40365		
4355	MOD. AIRPLANE	
36010		
13000	EXP. MFG. LABOR	
23010	EXP. MAINT. & REPAIR	

WORK SHEET

50-156-3 1.

DESIGN (ESTIMATE ' SUGGS - SEE RESUME,

SAN DIEGO ENGINEERING

TOTAL INCLUDING STRUCTURES 7780 M/HRS.
STRUCTURES 1458
6322
+ 450 MODIFIED SECURITY PROV.
6772 M/H TOTAL DESIGN (SANDIEGO)

MOFFETT FIELD ENGINEERING

MOD. PROG. { 3 MEN 5 MONTHS @ MOFFETT @ 200 HRS/MO. = 3000 M/HRS
3 " 5 " @ " @ 30 DAYS/MO. = 450 M/DAYS

FULL PROG. { 3 " 8 " @ " @ 200 HRS/MO. = 4800 M/HRS
3 " 8 " @ " @ 30 DAYS/MO. = 720 M/DAYS.

STRUCTURES (ESTIMATE BY SUGGS & GREEN - SEE RESUME)

1458 M/HRS. (AT SAN DIEGO)

CHECKING & RELEASES - (ESTIMATE BY GRAHAM)

100 M/HRS.

AERODYNAMICS (ESTIMATE BY SHICK - SEE MEMO 12 JAN 1953)

TOTAL (6 MO. PROGRAM) 9165 M/H
8100 M/H. @ SAN DIEGO
1065 M/H @ MOFFETT

3 MO. PROG. 20% REDUCTION

80% OF 8100 = 6480 M/HRS @ S.D.
80% OF 1065 = 852 " @ MOFFETT

2 MEN APPROX. 2 MO. @ MOFFETT @ 200 HRS/MO. = 1065 M/HRS.
2 " " @ " @ 30 DAYS/MO = 118 M/DAYS
80% OF ABOVE = 852 M/HRS
" " " = 94 M/DAYS.

DYNAMICS (ESTIMATE BY DUBLIN - SEE MEMO.)

TOTAL HOURS 6 MO. PROGRAM 10200 M/HRS.
1 MAN 6 MO. @ 200 HRS @ AT MOFFETT FIELD = 1200 + 400 = 1600
AT S.D. 8600 M/HRS.

FULL PROG. - 1 MAN 6 MONTHS @ MOFFETT @ 200 HRS/MO = 1200 M/HRS
MOD. PROG. - 1 MAN 3 " @ " @ " " 600 M/HRS
FULL PROG. 1 MAN 6 " @ " @ 30 DAYS/MO + 60 = 240 M/DAYS
MOD. PROG. 1 MAN 3 " @ " @ " " 90 M/DAYS.
FULL PROG. 1 MAN 8 TRIPS @ 1 WK EA = 60 DAYS = 400 HRS.
MOD PROG. 1 MAN 3 MONTHS @ S.D @ 200 HRS = 600 M/HRS

2.

PROPULSION (RAMI - ESTIMATE BY DITTM. NN
1½ MEN / 1 MO. = 300 HRS
" " = 45 DAYS

ENG. TEST LAB ESTIMATE BY STRONG - SEE MEMO 27 JAN. 1953
4 MEN 6 MO. = 720 M/DAYS
2 " 3 MO = 180 M/DAYS.

Plus Static Test of Facility at Moffett

INSTRUMENTATION (ESTIMATE BY T. KING & R. THOMPSON)

	3 MO.		6 MO	
	S.D.	MOFFETT	S.D.	MOFFETT
	2450 ✓	4800	2450 ✓	9600
		600		1200
		800		800
		5200		11600 ✓
OSCILLOGRAPH OMISSION		− 2800		
		2400 M/HRS. ✓		

8 MEN @ 30 DAYS/MO = 240 DAYS × 6 MO = 1440 M/DAYS.
" " = 240 " × 3 MO = 720 M/DAYS.

$1300	$3200	$1200	$6300
	+ 500 VIBRATION TEST		+ 500
	3700		6800
	− 1400 OMISSION OF OSCILLOGRAPHS		
	$2300		

EXPERIMENTAL SHOP

	71065			78250	
	20510	SHIP VIA TRUCK (ALTERNATE)		10520	VIA NAVY
	50555			67730	
✓	8500	HOIST (ALTERNATE)	✓	8500	HOIST
	42055			59230	
✓	36700	MAINTENENCE (MOD)	✓	53875	MAINT. (FULL)
	5355			5355	
✓	110	TOOLING		110	
✓	5245	ENG. TEST & MFG.		5245.	

PER DIEM - 25 MEN 30 DAYS/MO / 4 MO & 7 MO

LIAISON

		8 MO.	5 MO.
STRESS GR.	1 MAN 6 WKS @200	300	300
ELEC. GR.	1 " FULL TIME @200	1600	1000
CONTROLS GR.	1 " 8 WKS. @200	400	400
POWER P. & HYD.	2 " FULL TIME @200	3200	2000
		5500	3700
	PER/DIEM	825 M/D	555 M/D

FLIGHT ENGINEERING (EXP.)

FULL PROGRAM

6290	SAN DIEGO
7555	MOFFETT
13845	

MODIFIED PROGRAM

543A

FEB 20 1953 P+E

CONVAIR

INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 20 February 1953

TO L. Moore - Engineering Planning and Estimating

SUBJECT Model 5 Tethered Flight - Static Test of Facility at Moffet Field

Task: To supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast.

The proof load to be applied as follows:

1. The empty tank will be raised a short distance above the floor by means of the tethering gear.
2. Water will be added in increments of the 48,000 pound proof load and deflection of the hangar will be measured for each increment of load.

Cost Estimate: - Labor

	Engr. Hrs.
1. Design fixture	40
2. Liaison and conduct test	100
Total - - - - -	140

Materials

1. Steel - 10,000 lb at $0.08	$800.00
2. Valve and fittings	40.00
Total - - - - -	$840.00

In addition to the above estimate an allowance should be made for transporting the test tank to Moffett Field. Also a travel allowance for one man to Moffett Field and return plus per diem for five days should be included.

This estimate does not include Experimental Dept. costs for fabrication of the tank, etc.

E. F. Strong
E.F. Strong
Chief of Test Laboratory

EFS:el
cc: C.B. Carroll/J. Pike/Dave Faulk
D. Suggs
C.O. Ekrem
E.F. Strong
H.A. Welch
C. Conaway
Test Files

ROUTE & RETURN TO
INIT.
2/20

CONVAIR CONFIDENTIAL
SECURITY INFORMATION

FEB 20 1953
P&E

20 February 1953

L. Moore - Engineering Planning and Estimating

Model 5 Tethered Flight - Static Test of Facility at Moffet Field

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The proof load to be applied as follows:
1. The empty tank will be raised a short distance above the floor by means of the tethering gear.
2. Water will be added in increments of the 48,000 pound proof load and deflection of the hangar will be measured for each increment of load.

Cost Estimate: - Labor

	Engr. Hrs.	
1. Design fixture	40	S.D.
2. Liaison and conduct test	100	MOFFETT
Total - - - - -	140	

Materials

1. Steel - 10,000 lb at $0.08	$800.00	
2. Valve and fittings	40.00	
Total - - - - -	$840.00	S.D.

In addition to the above estimate an allowance should be made for transporting the test tank to Moffett Field. Also a travel allowance for one man to Moffett Field and return plus per diem for five days should be included.

This estimate does not include Experimental Dept. costs for fabrication of the tank, etc.

E.F. Strong
Chief of Test Laboratory

EFS:el
cc: C.B. Carroll/J. Pike/Dave Faulk
D. Suggs
C.O. Ekrem
E.F. Strong
H.A. Welch
C. Conaway
Test Files

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CONFIDENTIAL
SECURITY INFORMATION

WORK STATEMENT
for
Model 5 Captive Flight Tests

15 Jan. 1953

The Dynamics Group of the Engineering Test Laboratories will perform the following functions in connection with the execution of the Model 5 Captive Flight Test Program:

1. Engineer methods and means for obtaining any and all dynamic data desired.
2. Engineer calibration means and procedures; also auxiliary equipment as required.
3. Calibrate all dynamic pickups and associated amplifiers and recording equipment.
4. Take dynamic test data throughout the test program. Edit test data and provide preliminary data reduction.
5. Provide engineering liaison with Experimental Flight, other Engineering groups and Instrumentation.

The foregoing dynamic test procedures will be applied specifically to the following scheduled tests:

✓ 1. Flight operational techniques. (Turbo-Prop.

✓ 2. Airplane characteristics with and without Auto Pilot.

Main ✓ 3. Landing loads.

✓ 4. Control effectiveness investigation.

? 5. Dynamics stability and damping tests.

✓ 6. Special configuration tests.

✓ 7. Engine failure tests.

E. F. Strong
E.F. Strong
Chief of Test Laboratory

EFS:el

Test must be limited to those which could be accomplished without amplifiers

CONFIDENTIAL
SECURITY INFORMATION

SERIAL No. 50-156-3
PAGE 7

15 Jan. 1953

WORK STATEMENT
for
Model 5 Captive Flight Tests

7. DETAILED WORK STATEMENT (CONT)

V The Dynamics Group of the Engineering Test Laboratories will perform the following functions in connection with the execution of the Model 5 Captive Flight Test Program:

1. Engineer methods and means for obtaining any and all dynamic data desired.
2. Engineer calibration means and procedures; also auxiliary equipment as required.
3. Calibrate all dynamic pickups and associated amplifiers and recording equipment.
4. Take dynamic test data throughout the test program. Edit test data and provide preliminary data reduction.
5. Provide engineering liaison with Experimental Flight, other Engineering groups and Instrumentation.

The foregoing dynamic test procedures will be applied specifically to the following scheduled tests:

1. Flight operational techniques.
2. Airplane characteristics with and without Auto Pilot.
3. Landing loads.
4. Control effectiveness investigation.
5. Dynamics stability and damping tests.
6. Special configuration tests.
7. Engine failure tests.

E. F. Strong
E.F. Strong
Chief of Test Laboratory

EFS:el

Dave Faulk

Rec JAN 28 1953
P, E

Consolidated Vultee Aircraft Corporation
San Diego California

Date: 27 January 1953

To: L. Moore

Subject: Model 5 Tethered Flight Tests - Cost Estimate

Reference: Cost Proposal Outline Serial # 50-156-3, dated 15 January 1953.

The test program has been reviewed and the following estimate of cost is submitted herewith:

Estimate on Model 5 Tethered Flight tests at Moffett Field per Cost Proposal dated 1/15/53.

Task as outlined in C.P. (6 month test)

Preparation at San Diego	2 men 3 month	1200 hours. ✓
Task at Moffett	4 men 6 month	4800 hours. ✓
		6,000 hours

Task as modified in C.P. (3 month test)

Preparation at San Diego	2 men 2 1/2 month	1000 hours. ✓
Task at Moffett	~~4~~ 2 men 3 month	~~2400 hours.~~ 1200
		~~3,400~~ hours

Note these estimates are based on indicated schedules. If the programs are expanded, the estimates should be expanded proportionately.

Major test items required:

* 2 Recording 18 channel oscillographs complete	@ ~~$22,787.50~~ $25,000 EA. (capital equipm	
* 32 Channels of carrier amplifier and associated equipment		
~~8~~ Strain gage dynamometers at $250.	$2,000	—
10 ~~20~~ Accelerometers at $250.	~~$5,000~~	2500
200 Strain gages at $2.50	$ 500	500
** Misc equipment, cable etc	~~$3,500~~	3000.
	~~$11,000~~ 11,500	6000

* These two items are required in addition to the oscillographs installed in the airplane for flight tests. If two of the 5 sets of oscillograph equipment listed in Navy Facilities Equipment List will be available at the time of this test, these two items may be deleted.

(NOT AVAILABLE)

Consolidated Vultee Aircraft Corporation
San Diego California

Date: 27 January 1953

To: L. Moore

Subject: Model 5 Tethered Flight Tests - Cost Estimate

Reference: Cost Proposal Outline Serial # 50-156-3, dated 15 January 1953.

** This assumes that the rate of descent will be obtained from the supporting cable, camera or equally simple and inexpensive means. If a more complicated method is planned it should be listed seperately.

E. F. Strong

E. F. Strong
Chief of Test Laboratory

EFS:an
cc: C.B. Carroll
R.A. Ackley
Dave Faulk ✓
E. Strong
M.C. Brady (2)
Test File

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

DATE 26 January 1953

TO L. Moore
FROM M. Dublin
SUBJECT
Model XFY-1 Minimum Tethered Flight Test Program

Reference: a) Memo from W. J. Martin to C. B. Carroll "Minimum Tethered Flight Test Program for the Model 5 Airplane", dated January 22, 1953

b) Cost Proposal Outline Model 5 (XFY-1) Tethered Flight Tests at Moffett Field, Serial 50-156-3, dated January 15, 1953

c) Memo from M. Dublin to L. Moore "Model XFY-1 Tethered Flight Test Dynamics Man Hours" dated January 22, 1953

1. The following Dynamics man hours are required to complete the tasks stated in Reference a).

	Man Hours	
a. Operating technique studies	1,000	
b. Airplane hovering characteristics	1,200	20C
c. Landing loads	600	
d. Safety items	200	
	3,000	
	700	MOFFETT

In the above estimate, it is assumed that one Dynamics man will be stationed at Moffett Field. Further, it is assumed that three trips will be made to Moffett Field by Dynamics personnel. 1 MAN (2 WEEKS)

2. It is considered that the minimum program in Reference a) is insufficient to prove out the airplane for flight testing. Effort should be made to perform the program in accordance with References b) and c).

M. Dublin

cc: L. Moore
C. B. Carroll
E. D. Shannon/W.J. Martin
M. Dublin
Dynamics Files

2300 S.P.

Bernstein

L. Moore

CONVAIR

22 January 1953

6 MO. PROGRAM

Memo to: L. Moore

From: M. Dublin

Subject: Model XFY-1 Tethered Flight Test Dynamics Man Hours

Reference: a) Cost Proposal Outline Model 5 (XFY-1) Tethered Flight Tests at Moffett Field, Serial 50-156-3, dated January 15, 1953.

1. The following Dynamics man hours are required to complete the tasks stated in Reference a).

		Man Hours
a)	Operating technique studies S.O.	2,400
b)	Dynamic responses in hovering MPF	4,800
c)	Landing loads	1,200
d)	Safety items	600
e)	Vibration	1,200
		Σ = 10,200
		7,600
		8,600

1200 M/HRS.

2. In the above estimate it is assumed that one Dynamics man will be stationed at Moffett Field for the duration of the program. Further, it is assumed that eight trips will be made to Moffett Field by Dynamics personnel.

1 MAN @ 1 WK EA. TRIP = 60 days = 400 HRS.

M Dublin

M. Dublin

cc: L. Moore
C. B. Carroll
M. Dublin
Dyn. Files

Serial # 50-156-3

XFY-1 CAPTIVE FLIGHT TESTS

DETAIL WORK STATEMENT (DYNAMICS)

I. Operating technique

1. Develop a technique for landing in the presence of side winds from all angles.

2. Develop a ground technique to measure allowable deviations in airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

II. Airplane Hovering Characteristics

1. Without autopilot

   a) Determine airplane dynamic response in the presence of side winds from all angles

2. With autopilot

   a) Determine airplane dynamic response in the presence of side winds from all angles

   b) Determine optimum adjustments for autopilot

III. Loads

1. Determine landing loads and accelerations in the presence of side winds from all angles.

2. Determine shock strut responses

3. Determine loads in tethering cables

4. Determine rate of descent

IV. Vibration

1. Investigate vibration problems that are encountered.

V. Safety Items

1. Simulate initiation of transition and determine dynamic response

2. Determine airplane dynamic response with power failure

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SECURITY INFORMATION

Serial #50-156-3
January 12, 1953

XFY-1 CAPTIVE FLIGHT TESTS

DETAIL WORK STATEMENT (DYNAMICS)

NOTE: The following items, WHICH MAY BECOME OF A MAJOR NATURE, are not to be included in this proposal but are to be quoted separately after the requirements have been determined.

a) Dynamic investigations and corrective actions required as a result of captive flight testing.

b) Additional captive flight testing as desired by the Customer or recommended by the Contractor.

c) Modifications to the autopilot as a result of captive flight testing.

SPACE FOR ADDITIONAL INFO

3510 - 1755

543A

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SECURITY INFORMATION

CONVAIR

INTRA - COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

6 MO

DATE	9 January 1953
TO	L. Moore
SUBJECT	Preliminary Cost Proposal for Model 5 Tethered Flight Test Program

I. It is estimated that the tethered flight test program required by the Problem Statement issued in a memo from D. B. Suggs to C. B. Carroll on 23 December 1952 will require a total of 50 tethered flight hours and an elapsed calendar time of 5 1/2 months, assuming no contingencies. The following is a breakdown of the Experimental Flight requirements for the total program.

1. Estimated flight time	50 hours	
2. Estimated calendar time at test base. . . (no contingencies)	5 1/2 months	USE 6 MONTHS

3. Personnel

A. At San Diego prior to start of program

1)	1 Pilot	200 man hrs.	
2)	1 Flight Engineer	200 man hrs.	
3)	1 Sr. Flight Test Engineer	700 ~~350~~ man hrs.	CORRECTION - VERBAL
4)	2 Flight Test Engineers	1400 ~~700~~ man hrs.	J. MASON 1/23
		2500	

B. At the Test Base

1)	1 Pilot	Full Time	1170
2)	1 Flight Engineer	50% Time	585
3)	1 Sr. Flight Test Engineer	6½ Full Time	1170
4)	2 Flight Test Engineers	Full Time	2340
5)	1 Instrumentation Engineer	Full Time	1170
6)	1 Data Analyst	Full Time	1170
			7605 @ MOFFETT

@ 9 HRS/da.

C. At San Diego during program

1)	1 Flight Test Engineer	Full Time	1170
2)	1 Data Analyst	Full Time	1170
			2340

D. After completion of program AT S.D.

1)	2 Flight Test Engineers	750 man hrs.
2)	2 Data Analysts	750 man hrs.
		1500

6340 TOTAL @ S.D.

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SEE RIVSED MEMO

In determining the cost of the program from the above data, the following items should be considered:

1. Based on experience with XT-40 engines on the XP5Y-1 airplane, a 75% contingency is recommended for the engine installation. An additional 25% contingency is also recommended for the airplane type and control system. This would increase the elapsed calendar time for the test program at the test base to 11 months.
2. Per diem charges and automobile transportation costs at the test base should be included for one month prior to and throughout the entire program calendar time for all Experimental Flight personnel at the test base.
3. Fuel costs per flight hour will probably be greater than normal due to the large amount of ground running which will undoubtedly be required. It is suggested that fuel cost experience gained on the XP5Y-1 project be used as a guide in making this estimate.
4. Instrumentation requirements have not been included in the above and should be obtained from the Instrumentation Laboratory.
5. The above requirements are preliminary and subject to change until the final work statement for the program is received from the Planning and Estimating group.

OIL 1000 GAL/50 HRS. (EEL-3A)
FUEL 42000 GAL/50 HRS.

Prepared by J. H. Mason
J. H. Mason
Sr. Flight Test Engineer

Approved by W. J. Martin
W. J. Martin
Chief Test Pilot

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

Date: 22 January 1953

To: C. B. Carroll

Subject: Minimum Tethered Flight Test Program for the Model 5 Airplane

Reference: (a) Memo to C. B. Carroll from D. B. Suggs, 23 December 1952, Problem Statement for Model 5 Tethered Flight Installation in Moffett Field Hangar

(b) Memo to L. Moore from W. J. Martin, 9 January 1953, Preliminary Cost Proposal for Model 5 Tethered Flight Test Program

The Experimental Flight group has been requested to re-estimate the tethered flight test program requirements such that the calendar time for the program might be reduced to three months as compared to 5 1/2 months previously estimated in reference (b). To accomplish the program in a 3-month period, it will be necessary to eliminate some of the tests described in reference (a). It is felt that certain of those tests can be completely eliminated and others combined to evaluate the airplane so that reasonable safety can be insured in free flight and certain pertinent preliminary data can be obtained. The following reduced program is suggested for this purpose:

I. Operating Technique

1. Develop a ground technique to measure the allowable deviations in the airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

2. Develop a landing technique with no emphasis on loads or side winds.

II. Airplane Hovering Characteristics

1. Obtain airplane response data to provide basic design information.

2. Investigate control effectiveness.
   a. Elevator, aileron, rudder.
   b. Determine in steady hover at various lateral, vertical and longitudinal c.g. locations.

IV. Landing Loads

Obtain acceleration and impact loadings during landing to correlate with design analysis

V. Safety Items

Determine effect of failure of one power section on rate of descent.

To: C. B. Carroll
Subj: Minimum Tethered Flight Test Program for Mod 5 Airplane

It is estimated that the above described program will require a total of 24.5 flight hours and an elapsed calendar time of 3 months, assuming no contingencies. The following is a breakdown of the Experimental Flight requirements for the total program, with the program being conducted at a remote location.

1. Estimated flight time	24.5 hours	
2. Estimated calendar time (no contingencies)	3 months	
3. Personnel		
A. At San Diego prior to start of program		
1. One pilot	200 man hrs.	
2. One flight engineer	200 man hrs.	
3. One senior flight test engineer	700 man hrs.	2500
4. Two flight test engineers	1400 man hrs.	
B. At the test base		
1. One pilot	Full time	
2. One flight engineer	50% time	
3. One senior flight test engineer 6½	Full time	
4. Two flight test engineers	Full time	3800
5. One instrumentation engineer	Full time	
6. One data analyst	Full time	
C. At San Diego during the program		
1. One flight test engineer	Full time	
2. One data analyst	Full time	1170
D. After completion of the program AT S.D.		
1. Two flight test engineers	450 man hrs.	
2. Two data analysts	450 man hrs.	900

In addition to the above, some stenographic personnel would be required, but it is anticipated that this department's requirements can be filled through a stenographic pool. Consideration should also be given to providing one calculating machine for the exclusive use of Experimental Flight personnel at the test base.

Fuel requirements should be based on 50 hours of engine running to allow for ground runs. This would require 21,000 gals. of fuel. It is believed that 500 gals. of oil will cover all of the engine running for the program.

Based on experience with XT-40 engines on the XF5Y-1 airplane, a 75% contingency is recommended for the engine installation. An additional 25% contingency is also recommended for the airplane type and control system. This would increase the elapsed calendar time for the test program at the test base to 6 months.

To: C. B. Carroll
Subj: Minimum Tethered Flight Test Program for Mod 5 Airplane

Per diem charges and automobile transportation costs at the test base should be included for one month prior to and throughout the entire program calendar time for all Experimental Flight personnel at the test base. Transportation costs should also include two round-trips between San Diego and the test base for each month that the program is in progress.

The reduced flight program above does not appear to be accomplished with a significant cost reduction. The feasibility of further cost reduction is severely limited by the fixed costs incurred by conducting this test at a remote location, i.e., Moffett Field. The availability of facilities for the proper operation of this program is all important. This point is firmly established in this department by experience with the XT-40 engine on the XP5Y-1 airplane at San Diego and the Turbo Liner at Muroc. It is possible that the results obtained by a reduced flight test program as stated above could be accomplished with local facilities at no sacrifice of security, pilot safety and amount of quantitative data obtained. In the event further cost reduction is required, it is suggested that the possibility of performing the tethered flight tests locally be re-evaluated.

Prepared by J H Mason
J. H. Mason
Sr. Flight Test Engineer

Approved by W J Martin
W. J. Martin
Chief Test Pilot

Copies to:
L. Moore

JOB ESTIMATE WORK SHEET
ENGINEERING DEPARTMENT INSTRUMENTATION GROUP

PROJECT: Installation and Maintenance of Captive Flight Test Instrumentation Requirement.	D.L.H.	$ MAT'L
WORK ITEMS:		
1. Fabricate and install equipment. (S.D.)	2450	1200.
2. Progressively maintain and make minor modification im Instrumentation configuration for a period not to exceed six months. MOFFETT	9600	4800.
3. Provide data development and camera service. MOFFETT	1200	1500. 6200
4. Remove special captive flight instrumentation and restore airplane to full flight configuration. MOFFETT	800	
5. Travel to and from Base $800.00		
6. Transportation to accommodate 7-9 Instrumentation Group (8) personnel (2 autos). $850.00		
TOTALS	14,050	$7,500.00

NOTE: It is anticipated that subject tests will require a two shift operation at Moffet Field Base. It is further anticipated that Instrumentation Group personnel will assist Dept. 31 personnel in the general work - whenever our people are not actively engaged in Instrumentation work.

REMARKS: Estimate figures appearing on this sheet are a combination of those costs indicated in formal Work Statement to Dave Faulk dated 1-15-53, and subsequent Project Office meeting of 1-16-53.

COST PROPOSAL SER. NO: 52-62 DATE OF LAST C.P. REVISION:
ESTIMATE TO: Dave Faulk PHONE: 1706
ESTIMATED BY: T. R. King W. R. King DATE: 1-22-53 610/ph
Approved: Thompson

JOB ESTIMATE WORK SHEET

ENGINEERING DEPARTMENT INSTRUMENTATION GROUP

PROJECT: Installation and Maintenance of Captive Flight Test Instrumentation Requirement.	D.L.H.	$ MATL.
WORK ITEMS:		
1. Fabricate and install equipment. (S.D.)	2450	1300.
2. Progressively maintain and make minor modifications in instrumentation configuration for a period not to exceed three months. Moffett Field	4800	2400.
3. Provide data development and camera service. Moffett	600	800. 2200
4. Remove special captive flight instrumentation and restore airplane to full flight configuration. Moffett	800	
~~5. Travel to and from Base $400.00~~		
6. Transportation to accommodate 7-9 Instrumentation Group personnel (2 autos). $425.00		
NOTE: It is anticipated that subject tests will require a two shift operation at Moffet Field Base. It is further anticipated that Instrumentation Group personnel will assist Dept. 31 personnel in the general work - whenever our people are not actively engaged in Instrumentation work.		
REMARKS: Estimate figures appearing on this sheet are a combination of those costs indicated in formal Work Statement to Dave Faulk dated 1-15-53, and subsequent Project Office meeting of 1-16-53.		
TOTALS	8650	$4,500.

COST PROPOSAL SER. NO: 52-62 DATE OF LAST C.P. REVISION:

ESTIMATE TO: Dave Faulk PHONE: 1706

ESTIMATED BY: T.R. King T. R. King DATE: 1-22-53 610/ph

Approved: Thompson

ESTIMATE WORK SHEET

ENGINEERING DEPARTMENT INSTRUMENTATION GROUP

PROJECT: Model 5 Captive Flight Test - Moffet Field
Estimate to Dave Faulk dated 1-22-53. CP No.-52-62.

WORK ITEMS:

1. Delete all external oscillograph equipment as listed below.		
a. Brackets for 12 accelerameters.		
b. Racks for oscillograph equipment.		
c. Mounts for accelerameters on landing struts.		
d. 20 strain gauges on landing struts.		
e. Routing cables for strain gauges.		delete
f. Setting up of equipment at base.	2800	1400.
2. Travel to and from base $75.00		
	2800	$1400.00

REMARKS: Estimate figures appearing on this sheet are for the three month Captive Flight Test Estimate submitted 1-22-53.

18 June 1952

Dave Faulk
T. R. King
Approved: R. B. Thompson

1706
2-13-53

JOB ESTIMATE WORK SHEET

ENGINEERING DEPARTMENT INSTRUMENTATION GROUP

	D.L.H.	$ MAT'L
PROJECT: Model 5 Captive Flight Tests - Moffet Field. Addition of Vibration Study Instrumentation per revised edition of C.P.O. #50-156-3, dated January 23, 1953.		
WORK ITEMS:		
1. Fabricate and install 30 pc. vibration pickups per ETL drawing	500	250.
2. Provide additional oscillograph equipment to obtain desired values. Hook-up and calibrate.	500	250.
3. Estimated additional travel expenses. $200.00		~~200.~~
NOTE: ETL has estimated the cost of required vibration pickups. Per M. Brady - 1-27-53.		
NOTE! DICK THOMPSON SAYS THAT LABOR CAN BE OMITTED IF WORK IS PERFORMED AT MOFFETT FIELD.		
REMARKS: This budget request is in addition to estimate of general program estimate from this Group, dated 1-22-53.		
TOTALS	~~1000~~	$ ~~700.~~ 500

COST PROPOSAL SER. No: 50-156-3 DATE OF LAST C.P. REVISION: 1-23-53

ESTIMATE TO: Dave Faulk PHONE:

ESTIMATED BY: T. R. King T.R. King DATE: 1-28-53

Approved: Thompson

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

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INFORMATION

Date: 15 January 1953

To: Dave Faulk, Engineering Planning and Scheduling Group

Subject: Model 5 Captive Flight Tests to be Conducted at Moffet Field USAF Base

Reference: Requested Work Statement Indicating Proposed Instrumentation Task, per Conference Held 14 January 1953.

Those attending reference conference were:

D. Faulk	G. Shoaf	T. R. King
D. B. Suggs	M. Brady	R. B. Thompson
E. Strong	B. Campbell	C. A. Judd

It is understood from reference discussion that Instrumentation task concerning subject test will be as follows:

I. Tail Surface Temperature Survey

  A. To be accomplished at San Diego

    1. Fabricate and install 16 thermocouples on tail fins.

  B. To be accomplished at Moffet Field

    1. Terminate thermocouples, extend all cables and wires to a remote Brown Temperature Recorder.

II. Slipstream Velocity Survey

  A. To be accomplished at San Diego

    1. Fabricate three pressure rakes of ten pickups each.

    2. Provide 50 tube manometer board - 60" H_2O.

  B. To be accomplished at Moffet Field

    1. Mount rakes at various positions on fins.

    2. Route flexible tubing from rakes to remote manometer board.

III. Landing Loads

  A. To be accomplished at San Diego

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1. Provide brackets for 12 accelerometers.

2. Provide mounting racks for oscillograph equipment.

B. To be accomplished at Moffet Field

1. Provide mounts for the accelerometers on landing struts.

2. Install 20 strain gauges on landing struts.

3. Route cables for strain gauges and accelerometers, terminate to ground oscillographic equipment.

4. Set up oscillograph equipment and provide wiring for power supplies, i.e., batteries, inverters, etc.

IV. Telemetering to be used for Ground Tests

A. To be accomplished at Moffet Field

1. Plug in to existing flight instrumentation transmitters on ship and route coaxial signal cable from the ship to remote receiving station.

2. Set up receiving station with necessary interconnecting cables and power supplies.

V. Calibrations

A. To be accomplished at San Diego and Moffet Field

1. Provide test groups with calibrations of all instruments concerned before and during test program.

VI. Photographic Services

A. To be accomplished at San Diego

1. Provide personnel and equipment for processing pertinent microfilm and oscillograph tape.

D.L.H. and raw materials budget requirements for task indicated herein will be as follows:

		D.L.H.
1.	Fabricate parts for tests - San Diego	900
2.	Install parts for tests - San Diego	1000
3.	Maintain progressive changes and normal maintenance during tests (3 months), - Moffet Field	4800

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		D.L.H.
4.	Provide photo development and camera mount service during tests (3 months) - San Diego	900
5.	Restore airplane to flight configuration - San Diego and Moffet Field	800
		8400

Raw Materials $4,200.00

It is assumed at this time that the majority of instruments and related special equipment will be GFE.

At this time no formal listing of instrument requirements has been presented to this group. When this listing is made available to us we can estimate accordingly.

Tyrus R. King
T. R. King, Foreman
Instrumentation Group

Approved
R. B. Thompson, General Foreman
Instrumentation Group

TRK/ph
cc: R. A. Ackley
M. Brady
B. Campbell
D. Faulk
C. A. Judd
T. R. King
W. J. Martin
G. Shoaf
E. Strong
D. B. Suggs
R. B. Thompson
G. L. Peyton

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543A

SERIAL # 50-156-3

CONVAIR
INTRA-COMPANY CORRESPONDENCE
SAN DIEGO, CALIFORNIA

6 MO.

20% REDUCTION FOR 3 MO.

DATE 12 January 1953

TO Planning & Scheduling

SUBJECT Model 5 Captive Flight Program in the Moffett Field Hangar

1. It is estimated that 9165 aerodynamics man-hours will be required to complete the aerodynamics portion of the testing and analysis of the Model 5 captive flight program. Of this number of man-hours approximately 8100 will be consumed in San Diego and the remainder at the test site.

2. A brief description of the aerodynamics work involved in this program is as follows:

   (a) Investigated tares associated with design of tethering system, compute necessary corrections to measured data due to tethering system, provide liaison on aerodynamic loads imposed on tethering system, hangar and test equipment.

   (b) Make preliminary investigations of critical stability and control characteristics in hovering flight, obtain information regarding ranges of safe hovering flight and limiting airplane loading conditions for hovering.

   (c) Determine critical take-off and landing performance characteristics to insure adequate take-off accelerations are available for selected loading conditions and that suitable control of descent rate can be maintained.

   (d) Conduct a brief investigation of slipstream characteristics to investigate flow characteristics in the cockpit area and in the vicinity of the control surfaces.

2 MEN

3. Additional travel and per diem costs due to approximately 1065 man-hours at the test site should be computed. It is expected that this time will not be continuous, but rather a cumulative total of a number of short trips.

7 ROUND TRIPS.

Ralph Shick
R. H. Shick
Chief of Aerodynamics

1687

cc: Carroll
Shick
Boteler
Eng. File

Serial No. 50-156-3

Date: 15 January 1953

COST PROPOSAL OUTLINE

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

1. PROPOSAL REQUESTED/ORIGINATED BY: Model 5 Project Office (C. B. Carroll) Confidential Memo to L. Moore dated 23 December 1952

2. FOR SUBMITTAL TO: BuAer

3. DATE PROPOSAL IS TO BE SUBMITTED: To be determined by Contract Department.

4. TYPE OF BID DESIRED: Firm

5. TYPE OF CONTRACT CONTEMPLATED: Amendment to NOa(s) 51-936-C (CPFF)

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight. See Resume and Work Statement for Model 5 Restrained Hovering Flight Test Installation in Moffett Field Hanger - Report ZM-5-026.

Note: Autopilot testing at Moffett Field is contingent upon the receipt of Autopilot from Vendor in time to be installed in plane at San Diego before shipping Plane to Moffett Field. Cost of installation and testing of autopilot after plane has been shipped to Moffett Field shall be separately negotiated.

The Program and Alternate Programs for which cost estimates are to be submitted to the Customer are as follows:

A. Full Test Program consisting of:

(1) Delivery and Shipment of the airplane in accordance with Scheme A of Item 12.

(2) Design of test installations in accordance with Item VI of the Detail Work Statement and Subcontract Fabrication and

Serial No. 59-15663
Date: 15 January 1953

COST PROPOSAL OUTLINE

MODEL 5 (XFY-1) TETHERED FLIGHT TESTS AT MOFFETT FIELD

1. PROPOSAL REQUESTED/ORIGINATED BY: Model 5 Project Office (C. B. Carroll) Confidential Memo to L. Moore dated 23 December 1952

2. FOR SUBMITTAL TO: BuAer

3. DATE PROPOSAL IS TO BE SUBMITTED: To be determined by Contract Department.

4. TYPE OF BID DESIRED: Firm

5. TYPE OF CONTRACT CONTEMPLATED: Amendment to NOa(s) 51-956-C (CPFF)

6. GENERAL DESCRIPTION OF ARTICLES AND/OR SERVICES:

The Tethered Flight Tests to be conducted in the dirigible hanger at Moffett Field is a Restrained Hovering Flight Test accomplished by securing plane with cables and controls to limit plane's operation to a Captive Flight. See Resume and Work Statement for Model 5 Restrained Hovering Flight Test Installation in Moffett Field Hanger - Report ZM-5-026.

Note: Autopilot testing at Moffett Field is contingent upon the receipt of Autopilot from Vender in time to be installed in plane at San Diego before shipping Plane to Moffett Field. Cost of installation and testing of autopilot after plane has been shipped to Moffett Field shall be separately negotiated.

The Program and Alternate Programs for which cost estimates are to be submitted to the Customer are as follows:

A. Full Test Program consisting of:

(1) Delivery and Shipment of the airplane in accordance with Scheme A of Item 12.

(2) Design of test installations in accordance with Item VI of the Detail Work Statement and Subcontract Fabrication and

6.A.(2) Cont'd

erection of the installations including the Security Provisions as described in major purchased items required, Page 13a, Items 3a and 4a, and modification of the airplane in accordance with Item IV.A. of the Detail Work Statement.

(3) Accomplishment of the Test Program as outlined in the Detail Work Statement including Liaison and Maintenance and preparation of reports.

B. Full Test Program (Alternate Delivery and Shipment of the Airplane) Consisting of:

(1) Delivery and Shipment of the airplane in accordance with Scheme B of Item 12.

(2) Same as Item A (2) above.

(3) Same as Item A (3) above.

C. Full Test Program (Alternate Security Provisions) Consisting of:

(1) Same as Item A (1) above.

(2) Same as Item A (2) above except the Security provisions shall be as described under Items 3b and 4b of major purchased items required.

(3) Same as Item A (3) above.

D. Full Test Program (Alternate Delivery and Shipment of the Airplane and Alternate Security Provisions) Consisting of:

(1) Same as Item B (1) above.

(2) Same as Item C (2) above.

(3) Same as Item A (3) above.

E. Modified Test Program Consisting of:

(1) Same as Item A (1)

(2) Same as Item A (2)

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6.A.(2) Cont'd

erection of the installations including the Security Provisions as described in major purchased items required, Page 13a, Items 3a and 4a, and modification of the airplane in accordance with Item IV.A. of the Detail Work Statement.

(3) Accomplishment of the Test Program as outlined in the Detail Work Statement including Liaison and Maintenance and preparation of reports.

B. Full Test Program (Alternate Delivery and Shipment of the Airplane) Consisting of:

(1) Delivery and Shipment of the airplane in accordance with Scheme B of Item 12.

(2) Same as Item A (2) above.

(3) Same as Item A (3) above.

C. Full Test Program (Alternate Security Provisions) Consisting of:

(1) Same as Item A (1) above.

(2) Same as Item A (2) above except the Security provisions shall be as described under Items 3b and 4b of major purchased items required.

(3) Same as Item A (3) above.

D. Full Test Program (Alternate Delivery and Shipment of the Airplane and Alternate Security Provisions) Consisting of:

(1) Same as Item B (1) above.

(2) Same as Item C (2) above.

(3) Same as Item A (3) above.

E. Modified Test Program Consisting of:

(1) Same as Item A (1)

(2) Same as Item A (2)

6.E.(3)

(3) Same as Item A (3) except as follows:

(a) Omit Item I.B.2(a) page 2 as outlined in Detail Work Statement.

(b) Omit Item I.E.1 page 2a as outlined in Detail Work Statement.

(c) Omit Item I.F.1(a) and (b) page 2a as outlined in Detail Work Statement.

(d) Omit all tests requiring the use of oscillographs other than those installed in the airplane.

(e) Minimize Item I.F.2(a) and (b) page 2a as outlined in Detail Work Statement.

(f) Minimize Item I.A.2 page 2 as outlined in Detail Work Statement.

F. Modified Test Program (Alternate Delivery and Shipment of the Airplane) Consisting of:

(1) Same as Item B (1).

(2) Same as Item A(2) above.

(3) Same as Item E(3) above.

G. Modified Test Program (Alternate Security Provisions) Consisting of:

(1) Same as Item A (1) above.

(2) Same as Item C (2) above.

(3) Same as Item E (3) above.

H. Modified Test Program (Alternate Delivery and Shipment of the Airplane and Alternate Security Provisions) Consisting of:

(1) Same as Item B (1) above.

(2) Same as Item C (2) above.

(3) Same as Item E (3) above.

6.E.(3)

(3) Same as Item A (3) except as follows:

(a) Omit Item I.B.2(a) page 2 as outlined in Detail Work Statement.

(b) Omit Item I.E.1 page 2a as outlined in Detail Work Statement.

(c) Omit Item I.F.1(a) and (b) page 2a as outlined in Detail Work Statement.

(d) Omit all tests requiring the use of oscillographs other than those installed in the airplane.

(e) Minimize Item I.F.2(a) and (b) page 2a as outlined in Detail Work Statement.

(f) Minimize Item I.A.2 page 2 as outlined in Detail Work Statement.

F. Modified Test Program (Alternate Delivery and Shipment of the Airplane) Consisting of:

(1) Same as Item B (1).

(2) Same as Item A(2) above.

(3) Same as Item E(3) above.

G. Modified Test Program (Alternate Security Provisions) Consisting of:

(1) Same as Item A (1) above.

(2) Same as Item C (2) above.

(3) Same as Item E (3) above.

H. Modified Test Program (Alternate Delivery and Shipment of the Airplane and Alternate Security Provisions) Consisting of:

(1) Same as Item B (1) above.

(2) Same as Item C (2) above.

(3) Same as Item E (3) above.

7. DETAIL WORK STATEMENT

I. The following is an outline of Experimental Flight responsibilities for the total program.

A A. Operating Technique

1. Develop a ground technique to measure the allowable deviations in the airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

2. Develop a landing technique for various loads and side wind conditions. (Side wind conditions omitted in Mod. Program)

B B. Airplane Hovering Characteristics

1. Autopilot not installed or not in operation.

   (a) Obtain information necessary to check the progress of the autopilot design.

   (b) Determine effects of side winds from all possible angles.

2. Autopilot installed.

   (a) Check airplane response, with autopilot in operation, to determine optimum autopilot adjustment and information for autopilot design improvement.

C C. Landing Loads

Obtain acceleration and impact loadings during landing to correlate with the design analysis.

D D. Stability and Control

1. Investigate control effectiveness.

   (a) Elevator, aileron, rudder.

   (b) Determine in steady hover at various lateral, vertical and longitudinal c.g. locations.

2. Dynamic stability.

   (a) With immediate attempted recovery.

   (b) With delayed attempted recovery.

7. DETAIL WORK STATEMENT

I. The following is an outline of Experimental Flight responsibilities for the total program.

A. Operating Technique

1. Develop a ground technique to measure the allowable deviations in the airplane accelerations, angles and power delivered in order to perform a [illegible] without a signal from the pilot.

2. Develop a landing technique for various loads and side wind conditions. (Side wind conditions omitted in Mod. Program)

B. Airplane Hovering Characteristics

1. Autopilot not installed or not in operation.

(a) Obtain information necessary to check the progress of the autopilot design.

(b) Determine effects of side winds from all possible angles.

2. Autopilot installed.

(a) Check airplane response, with autopilot in operation, to determine optimum autopilot adjustment and information for autopilot design improvement.

C. Landing Loads

Obtain acceleration and impact loadings during landing to correlate with the design analysis.

D. Stability and Control

1. Investigate control effectiveness.

(a) Elevator, aileron, rudder.

(b) Determine in steady hover at various lateral, vertical and longitudinal c.g. locations.

2. Dynamic stability.

(a) With immediate attempted recovery.

(b) With delayed attempted recovery.

7. DETAIL WORK STATEMENT (Cont'd

E E. Performance

1. Acceleration vs. time at full takeoff power for 3 second period, if possible.

F F. Safety Items

1. Simulate pitch-up in flight normal to centerline.

(a) Simulate with ballast in vertical tail.

(b) Simulate thrust center of gravity eccentricity moment by shifting ballast.

2. Engine failure ~~(minimum program)~~ (in the modified program this test would be limited to qualitative data only)

(a) Determine effect of failure of one power section on rate of descent.

(b) Determine effect of complete power failure on longitudinal control.

3. Investigate lateral ~~transition~~ translation and rate of descent within limits of tethered flight.

7. DETAIL WORK STATEMENT (Cont'd

E. Performance

1. Acceleration vs. time at full takeoff power for 7 second period, if possible.

F. Safety Items

1. Simulate pitch-up in flight normal to centerline.

(a) Simulate with ballast in vertical tail.

(b) Simulate thrust center of gravity eccentricity moment by shifting ballast.

2. Engine failure [illegible] (in the modified program this test would be limited to qualitative data only)

(a) Determine effect of failure of one power section on rate of descent.

(b) Determine effect of complete power failure on longitudinal control.

3. Investigate lateral transition and rate of descent within limits of tethered flight.

7. DETAILED WORK STATEMENT (Cont'd)

II. Description of the aerodynamics work involved in this program is as follows:

A. Investigated tares associated with design of tethering system, compute necessary corrections to measured data due to tethering system, provide liaison on aerodynamic loads imposed on tethering system, hangar and test equipment.

B. Make preliminary investigations of critical stability and control characteristics in hovering flight, obtain information regarding ranges of safe hovering flight and limiting airplane loading conditions for hovering.

C. Determine critical take-off and landing performance characteristics to insure adequate take-off accelerations are available for selected loading conditions and that suitable control of descent rate can be maintained.

D. Conduct a brief investigation of slipstream characteristics to investigate flow characteristics in the cockpit area and in the vicinity of the control surfaces.

7. DETAILED WORK STATEMENT (Cont'd)

II. Description of the aerodynamics work involved in this program is as follows:

A. Investigated tares associated with design of tethering system, compute necessary corrections to measured data due to tethering system, provide liaison on aerodynamic loads imposed on tethering system, hangar and test equipment.

B. Make preliminary investigations of critical stability and control characteristics in hovering flight, obtain information regarding ranges of safe hovering flight and limiting airplane loading conditions for hovering.

C. Determine critical take-off and landing performance characteristics to insure adequate take-off accelerations are available for selected loading conditions and that suitable control of descent rate can be maintained.

D. Conduct a brief investigation of slipstream characteristics to investigate flow characteristics in the cockpit area and in the vicinity of the control surfaces.

7. DETAILED WORK STATEMENT (Cont'd)

III Description of the Dynamics Work involved in this program is as follows:

A. Operating technique

1. Develop a technique for landing in the presence of side winds from all angles.

2. Develop a ground technique to measure allowable deviations in airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

B. Airplane Hovering Characteristics

1. Without autopilot

a) Determine airplane dynamic response in the presence of side winds from all angles.

2. With autopilot

a) Determine airplane dynamic response in the presence of side winds from all angles.

b) Determine optimum adjustments for autopilot

C. Loads

1. Determine landing loads minimum program and accelerations in the presence of side winds from all angles.

2. Determine shock strut responses

3. Determine loads in tethering cables

4. Determine rate of descent

D. Vibration

1. Investigate vibration problems that are encountered.

D. Safety Items

1. Simulate initiation of transition and determine dynamic response.

2. Determine airplane dynamic response with power failure

E. Vibration

1. Investigation of Vibration Problems

7. DETAILED WORK STATEMENT (Cont'd)

III. Description of the Dynamics Work involved in this program is as follows:

A. Operating technique:

1. Develop a technique for landing in the presence of side winds from all angles.

2. Develop a ground technique to measure allowable deviations in airplane accelerations, angles and power delivered in order to perform a catch without a signal from the pilot.

B. Airplane Hovering Characteristics:

1. Without autopilot:

a) Determine airplane dynamic response in the presence of side winds from all angles.

2. With autopilot:

a) Determine airplane dynamic response in the presence of side winds from all angles.

b) Determine optimum adjustments for autopilot.

C. Loads:

minimum program
1. Determine landing loads, and accelerations in the presence of side winds from all angles.

2. Determine shock strut responses.

3. Determine loads in tethering cables.

4. Determine rate of descent.

D. Safety Items:

1. Simulate initiation of transition and determine dynamic response.

2. Determine airplane dynamic response with power failure.

E. Vibration.

1. Investigation of Vibration Problems:

7. DETAILED WORK STATEMENT (Cont'd)

Note: The following items, which may become of a major nature, are not to be included in this proposal but are to be quoted separately after the requirements have been determined.

a) Dynamic investigations and corrective actions required as a result of captive flight testing.

b) Additional captive flight testing as desired by the Customer or recommended by the Contractor.

c) Modifications to the autopilot as a result of captive flight testing.

7. DETAILED WORK STATEMENT (Cont'd)

Note: The following items, which may become of a major nature, are not to be included in this proposal but are to be quoted separately after the requirements have been determined.

a) Dynamic investigations and corrective actions required as a result of captive flight testing.

b) Additional captive flight testing as desired by the Customer or recommended by the Contractor.

c) Modifications to the autopilot as a result of captive flight testing.

7. DETAILED WORK STATEMENT (Continued)

IV. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to hoist and controls to accomplish Tethered or Captive condition.

B. Supply mechanics [redacted] to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply spare parts, fittings, tools and equipment to maintain a "Shop" at Moffett Field.

D. Maintain, service and repair Tethering equipment during test program.

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department will be required to handle this task.

F. Pilot's Escape provisions as described in Report ZM-5-026 requires hooks to be installed on the windshield structure above the Pilot's seat. This part to be the responsibility of Experimental Department.

G. Proof Loading Test of Hanger and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hanger structure and Hoist during the tethered flight test. Engineering Test Laboratory and Instrumentation Group will render their services for this test also.

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practice. Two (2) full time inspectors will be required at Moffett Field for this purpose.

H. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus securing an erector.

7. DETAILED WORK STATEMENT (Continued)

IV. Experimental Department's task will consist of the following:

A. Modify subject test plane at San Diego with such attachments as designed to fasten plane to Hoist and controls to accomplish Tethered or Captive condition.

B. Supply mechanics and electricians to maintain, service and repair plane at Moffett Field. Classification and number of each classification required to be determined by Experimental Department.

C. Supply spare parts, fittings, tools and equipment to maintain a "Shop" at Moffett Field.

D. Maintain, service and repair Tethering equipment during test program.

E. As stated in paragraph 12, "Delivery and Shipping Instructions", Experimental Department will be required to handle this task.

F. Pilot's Escape provisions as described in Report ZM-5-026 requires hooks to be installed on the windshield structure above the Pilot's seat. This part to be the responsibility of Experimental Department.

G. Proof-loading Test of Hanger and Hoist will require the fabrication of Platform/Tank to be used to simulate loads which will be imposed on Hanger structure and Hoist during the tethered flight test. Engineering Test Laboratory and Instrumentation Group will render their services for this test also.

NOTE: All modification, repair, disassembly and/or assembly work on subject airplane will be accomplished under established shop and inspection practice. Two (2) full time inspectors will be required at Moffett Field for this purpose.

H. Fabrication only of Hoist Equipment Platform. This may or may not be an experimental task. Cost comparison with vendor's costs being the consideration plus securing an erector.

7. DETAILED WORK STATEMENT (Cont'd)

V. The Dynamics Group of the Engineering Test Laboratories will perform the following functions in connection with the execution of the Model 5 Captive Flight Test Program:

1. Engineer methods and means for obtaining any and all dynamic data desired.

2. Engineer calibration means and procedures; also auxiliary equipment as required.

3. Calibrate all dynamic pickups and associated amplifiers and recording equipment.

4. Take dynamic test data throughout the test program. Edit test data and provide preliminary data reduction.

5. Provide engineering liaison with Experimental Flight, other Engineering groups and Instrumentation.

The foregoing dynamic test procedures will be applied specifically to the following scheduled tests:

(a) Flight operational techniques.

(b) Airplane characteristics with and without Auto Pilot.

(c) Landing loads.

(d) Control effectiveness investigation.

(e) Dynamics stability and damping tests.

(f) Special configuration tests.

(g) Engine failure tests.

6. Static Test of facility at Moffett Field. This task will be to supply a dead weight fixture capable of containing 48,000 pounds (including fixture weight) and having a tare weight that can be trimmed to 13,000 pounds, water to be used as ballast. Proof load to be applied as follows:

(a) The empty tank will be raised a short distance above floor by means of the tethered gear.

(b) Water will be added in increments of 48,000 pounds proof load and deflection of the hanger will be measured for each increment of load.

7. DETAILED WORK STATEMENT (Continued)

7. The Dynamics Group of the Engineering Test Laboratories will perform the following functions in connection with the execution of the Model 51 Captive Flight Test Program:

a. Engineer methods and means of obtaining any and all dynamic data desired.

b. Engineer calibration means and procedures and auxiliary equipment as required.

c. Calibrate all dynamic pickups and associated amplifiers and recording equipment.

d. Take dynamic test data throughout the test program. Edit test data and provide preliminary data reduction.

e. Provide engineering liaison with Experimental Flight, other Engineering groups and Instrumentation.

The foregoing dynamic test procedures will be applied specifically to the following scheduled tests:

a. Flight operational techniques.

b. Airplane characteristics with and without Auto Pilot.

c. Landing loads.

d. Control effectiveness investigation.

e. Dynamics stability and damping tests.

f. Special configuration tests.

g. Engine failure tests.

[illegible]

[illegible]

[illegible]

VI Engineering Design task is as follows: is as follows.

A. Proposal and General Study

B. Hoist and Tethering Controls Installation

(a) Hoisting Mechanism

(b) Counter Balance Mechanism

(c) Automatic Control Equipment

(d) Reels and Brake

(e) Cable Assemblies

(f) Pneumatic Snubber for Nose Cable

(g) Pulleys, Idlers and Mounting

(h) Tethering Line Installation

C. Hoisting Beam Installation

(a) Beam Structure

(b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation

(a) Curtains at Arch 3, Doors and Corridor

(1) Curtain Catenary and Support Cables

(2) Curtain Reinforcement and Support Fittings

(3) Curtain Support Beam and Mast Rework

(b) Cyclone Fence Installation

(1) At Arch 3

(2) At corridor

(3) At doors

VI. Engineering Design task is as follows:

A. Proposal and General Study

B. Hoist and Tethering Controls Installation

(a) Hoisting Mechanism

(b) Counter Balance Mechanism

(c) Automatic Control Equipment

(d) Reels and Drums

(e) Cable Assemblies

(f) Pneumatic Snubber for Nose Cable

(g) Pulleys, Idlers and Mounting

(h) Tethering Line Installation

C. Hoisting Beam Installation

(a) Beam Structure

(b) Frame and Mounting for Reels, Motor, Clutch, Brake and Controls

D. Security Provisions Installation

(a) Curtains at Arch 3, Doors and Corridor

(1) Curtain Catenary and Support Cables

(2) Curtain Reinforcement and Support Fittings

(3) Curtain Support Beam and Mast Rework

(b) Cyclone Fence Installation

(1) At Arch 3

(2) At corridor

(3) At doors

E. Pilot's Escape Provisions Installation

- (a) Friction Clutch and Reel
- (b) Harness, Cable and Attachments

F. Airplane Modifications

- (a) Cable Attachment at Nose
- (b) Tethering Line Attachment
- (c) Installation of Tethering and Brake Controls
- (d) Plane to Ground Communications

G. Procurement, Release and Check

H. Installation Liaison

- (a) Mechanical
- (b) Electrical

E. Plastic Escape Provisions Installation

(a) Friction Clutch and Reel

(b) Harness, Cable and Attachments

F. Airplane Modification

(a) Cable Attachment at Nose

(b) Tethering Line Attachment

(c) Installation of Tethering and Brake Controls

(d) Plane to Ground Communications

G. Procurement, Release and Check

H. Installation Liaison

(a) Mechanical

(b) Electrical

7. DETAILED WORK STATEMENT (Cont'd)

VII. Instrumentation task concerning subject test will be as follows:

A. Tail Surface Temperature Survey

1. To be accomplished at San Diego

a. Fabricate and install 16 thermocouples on tail fins.

2. To be accomplished at Moffett Field

a. Terminate thermocouples, extend all cables and wires to a remote Brown Temperature Recorder.

B. Slipstream Velocity Survey

1. To be accomplished at San Diego

a. Fabricate three pressure rakes of ten pickups each.

b. Provide 50 tube manometer board - 60" H_2O.

2. To be accomplished at Moffett Field

a. Mount rakes at various positions on fins.

b. Route flexible tubing from rakes to remote manometer board.

C. Landing Loads

1. To be accomplished at San Diego

a. Provide brackets for 12 accelerometers.

b. Provide mounting racks for oscillograph equipment.

2. To be accomplished at Moffett Field

a. Provide mounts for the accelerometers on landing struts.

b. Install 20 strain gauges on landing struts.

c. Route cables for strain gauges and accelerometers, terminate to ground oscillographic equipment.

d. Set up oscillograph equipment and provide wiring for power supplies, i.e., batteries, inverters, etc.

7. DETAILED WORK STATEMENT (Cont'd)

VII. Instrumentation task concerning subject test will be as follows:

A. Tail Surface Temperature Survey

1. To be accomplished at San Diego

a. Fabricate and install 16 thermocouples on tail fins.

2. To be accomplished at Moffett Field

a. Terminate thermocouples, extend all cables and wires to a remote Brown Temperature Recorder.

B. Slipstream Velocity Survey

1. To be accomplished at San Diego

a. Fabricate three pressure rakes of ten pickups each.

b. Provide 50 tube manometer board - 60" H_2O.

2. To be accomplished at Moffett Field

a. Mount rakes at various positions on fins.

b. Route flexible tubing from rakes to remote manometer board.

C. Landing Loads

1. To be accomplished at San Diego

a. Provide brackets for 12 accelerometers.

b. Provide mounting racks for oscillograph equipment.

2. To be accomplished at Moffett Field

a. Provide mounts for the accelerometers on landing struts.

b. Install 20 strain gauges on landing struts.

c. Route cables for strain gauges and accelerometers, terminate to ground oscillographic equipment.

d. Set up oscillograph equipment and provide wiring for power supplies, i.e., batteries, inverters, etc.

7. DETAILED WORK STATEMENT (Cont'd)

VII.

D. Telemetering to be used for Ground Tests

1. To be accomplished at Moffett Field

a. Plug in to existing flight instrumentation transmitters on ship and route coaxial signal cable from the ship to remote receiving station.

b. Set up receiving station with necessary interconnecting cables and power supplies.

E. Calibrations

1. To be accomplished at San Diego and Moffett Field

a. Provide test groups with calibrations of all instruments concerned before and during test program.

F. Photographic Services

1. To be accomplished at Moffett Field.

a. Provide personnel and equipment for processing pertinent microfilm and oscillograph tape.

G. Proof Loading Test

a. Provide Equipment as required.
See Page 6, Paragraph G.

Note: It is assumed at this time that the majority of instruments and related special equipment will be GFE.

7. DETAILED WORK STATEMENT (Cont'd)

VII.

D. Telemetering to be used for Ground Tests

1. To be accomplished at Moffett Field

a. Plug in to existing flight instrumentation transmitters on ship and route coaxial signal cable from the ship to remote receiving station.

b. Set up receiving station with necessary interconnecting cables and power supplies.

E. Calibrations

1. To be accomplished at San Diego and Moffett Field

a. Provide test groups with calibrations of all instruments concerned before and during test program.

F. Photographic Services

1. To be accomplished at Moffett Field.

a. Provide personnel and equipment for processing pertinent microfilm and oscillograph tape.

G. Proof Loading Test

a. Provide Equipment as required.
See Page 6, Paragraph G.

Note: It is assumed at this time that the majority of instruments and related special equipment will be GFE.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

1. North end of Hanger to Arch #3 except Shop area along West side.
2. Four (4) Mooring Masts
3. 8 Foot "Cyclone" wire fence (approx. 170 Ft.)
4. 3 - 30 Ft. Sections and 2 - 24 Ft. Sections of movable fence to be used as gates.
5. Monorail Cars and operators (4) to assist subcontractor and Convair in setting up Tethered Flight Test equipment.
6. One Monorail Car to stand by during actual "Flight" of Captive Plane, with Pilot Escape equipment installed to Car. (No operator required)
7. Partitioned Office at East Side of Hanger between Arch #2 and #3.
8. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.
9. U. S. Marine Corps Guard for Security during entire Test Program.
10. Electric Power
11. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)
12. Photo Lab. Facilities
13. Fire fighting equipment adequate for all possible emergencies during this type of test program.
14. First Aid and Emergency Hospital Facilities.

IX. Personnel (Convair) Accommodations and Facilities at Moffett Field.

1. Transportation Requirements will be provided by Convair. [illegible] These will have to be rented.
[illegible]
2. Personnel assigned to Moffett Field will be on a per diem basis. Quarters will have to be arranged for at either San Jose or Palo Alto.

7. DETAIL WORK STATEMENT (Cont'd)

VIII. The following items are to be Government furnished:

A. Moffett Field facilities, and personnel required to conduct the subject tests:

1. North end of Hanger to Arch #3 except Shop area along West side.

2. Four (4) Mooring Masts

3. 6 Foot "Cyclone" wire fence (approx. 170 Ft.)

4. 3 - 30 Ft. Sections and 2 - 21 Ft. Sections of movable fence to be used as gates.

5. Monorail Cars and operators (2) to assist subcontractor and Convair in setting up Tethered Flight Test equipment.

6. One Monorail Car to stand by during actual "Flight" of Captive Plane, with Pilot Escape equipment installed to Car.

7. Partitioned Office at East Side of Hanger between Arch #2 and #3.

8. Partitioned Room on 2nd Deck, East Side for Convair's use as Observer's Station.

9. U. S. Marine Corps Guard for Security during entire Test Program.

10. Electric Power

11. Moffett Field Government employees for Emergency Assistance (Approx. 2 men 3 mos.)

12. Photo Lab. Facilities

13. Fire fighting equipment adequate for all possible emergencies during this type of test program.

14. First Aid and Emergency Hospital Facilities.

IX. Personnel (Convair) Accommodations and Facilities at Moffett Field.

1. Transportation Requirements will be provided by Convair. These will have to be rented.

2. Personnel Lodging at Moffett Field will be on a per diem basis. Lodging will have to be arranged for at either San Jose or Palo Alto.

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned. A Final Report of tests will be submitted to Customer.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel fabrication and erection
(b) Motor driven hoist assembly and installation
(c) Fabric (canvas) curtain manufacture and installation

11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's Pre-Flight Evaluation Tests.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Alternate schemes for delivery and shipment of subject airplane are to be considered:

Scheme A.

Model 5, Ship Number One shall be disassembled at Convair Plant, San Diego: crated and shipped to Moffett Field by truck. Plane to be reassembled for tests. After tests are completed, plane shall be disassembled, crated, and returned to Convair where it will be reassembled. This task to be accomplished by Experimental Department. Experimental Department task does not include shipping.

Scheme B.

Model 5, Ship Number One, completely assembled except for propeller, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

8. TYPE OF ENGINEERING PROPOSED:

Design Engineering will prepare all drawings necessary for the design of equipment and/or facilities to accomplish subject tests. Technical Data showing results of these tests will be reported by Technical Groups concerned. A Final Report of tests will be submitted to Customer.

9. TYPE OF TOOLING PROPOSED:

None except as required by subcontractors for their own manufacturing.

10. TYPE OF MANUFACTURE PROPOSED:

(a) Steel fabrication and erection
(b) Motor driven hoist assembly and installation
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11. TYPE OF FLIGHT PROGRAM PROPOSED:

Flight Tests at Moffett Field are Contractor's Pre-Flight Evaluation Tests.

12. DELIVERY AND SHIPPING INSTRUCTIONS:

Alternate schemes for delivery and shipment of subject airplane are to be considered:

Scheme A. Model 5, Ship Number One shall be disassembled at Convair Plant, San Diego, crated and shipped to Moffett Field by truck. Plane to be reassembled for tests. After tests are completed, plane shall be disassembled, crated, and returned to Convair where it will be reassembled. This task to be accomplished by Experimental Department. Experimental Department task does not include shipping.

Scheme B. Model 5, Ship Number One, completely assembled except for propeller, shall be delivered to Moffett Field and returned to San Diego by the Navy using Navy shipping facilities and personnel.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls

2. ~~Nose-Cable-Snubber~~ Snubbing Cylinders (2)

3. Counter Balance Cable Snubber.

4. Tail Cable Snubber.

2 2. Hoist Beam Structure

3 3. Security Provisions (See Drwg. S-02104)

(a) Curtain Enclosures for entire test area.
(b) Curtain Enclosure (50 ft. sq.) for plane only.

4 4. (a) 250 Feet of Cyclon Fencing. This prchased fencing plus fencing supplied by Navy at Moffett Field to be installed and priced as one contract.

(b) Alternate arrangement will require using only fencing supplied by Navy at Moffett Field. To be priced installed.

5 5. Pilot's Escape Provisions - See Report ZM-5-026, Page 20. (Modification of Plane by Experimental Dept.)

6 6. ~~Platform~~ (See Rev. Drawing 5-02104) no platform required. In lieu of platform a 1/4" steel plate 12 feet square (one piece) shall be placed directly on existing concrete floor. Thermal insulation to be installed between steel plate and concrete floor.

Note: The above items will be manufactured and installed by Subcontractors by Personnel approved under Security Regulations. Sub-Contractors will be required to make available their representative at such times as believed necessary by Convair Test Supervisor. All Installations may ~~will~~ be removed after test program is completed ~~by Vendor.~~ At customer's option, test installations may be left in place for future use. To be priced each way.

13. MAJOR PURCHASED ITEMS REQUIRED:

1. Elevator Hoist and Tethering Controls

   Nose Cable Snubber, Snubbing Cylinders (2)

   Counter Balance Cable Snubber.

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14. CAPITAL FACILITIES REQUIRED:

Requirements are to be determined and separate list submitted.

15. PROPOSED PROGRAM SCHEDULE:

A. Engineering Final Release 1 June 1953

B. Tooling and Manufacture Completion 1 August 1953

C. Flight Program Completion - Establishment of a Flight Program Schedule is dependent upon new engine delivery date presently being established.

16. APPLICABLE SPECIFICATIONS OR DESCRIPTIVE DATA AVAILABLE FOR ESTIMATING PURPOSES:

1. Drwg. 5-02104 "Proposal - XFY-1 Tethered Flight"
2. "Moffett Field Trip Report" dated 29 November 1952
3. "Problem Statement Outline" dated 23 December 1952
4. "Resume and Work Statement" Report ZM-5-026
5. Cost Proposal Outline Serial No. 50-156-3 dated 15 Jan. 1953

17. ENGINEERING COORDINATOR ASSIGNED: D. B. Suggs PHONE NO. W-6611
Ext. 1766

18. SCHEDULE FOR DEPARTMENTAL COST ESTIMATES AND DATA TO BE SUBMITTED TO CONTRACTS DEPARTMENT (to be supplied by Contracts Department or arrived at in proposal meeting)

Prepared by:
ENGINEERING PLANNING AND ESTIMATING

LM:DKF:vj

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